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ARTICLE I.

HICKOK'S RATIONAL PSYCHOLOGY.

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Rational Psychology; or the Subjective Idea and Objective Law of all Intelligence. By LAURENS P. HICKOK, D.D., Union College. New York: Ivison, Phinney & Co. Boston: Brown & Taggard.

No treatise on mental philosophy, in any of its departments, can be a matter of indifference to the theologian and the scholar, unless the imbecility of its discussions and the triteness of its topics make it absolutely worthless and vain. No treatise, especially, that exhibits mental power, while it pursues, or professes to pursue things as yet unattempted in the regions of thought, can be without interest to the religious teacher, who has to do with mind in so many of the forms of its most important developments. Success or failure in the efforts bestowed in any such case, when the grounds of the one or of the other are clearly apprehended, awakens thought, imparts lessons and makes what really lies within the reach of human ken, not more dingy and obscure in its outlines, but more distinct and palpable to the apprehension. The author of the Rational Psychology intends, in his treatise on the subjective idea and objective law of all intelligence, as he assures us, no middle flight; for it is not his purpose to ascertain simply what *is*, and the law which regulates the phenomena in any sphere of inquiry, but

he is to ascend above all academies, and porches and mounts, whether ancient or modern, and determine at once not simply what is, and the law by induction that regulates the phenomena, but what must be, by a light that beams from the mental sphere itself, the empyrean of the pure and immutable reason. That this is a somewhat lofty assumption, can not be denied. It has certainly in some small, if not large degree, the air of pretension; and if expectations awakened by such enunciated claims should not be all realized, we suppose it would not be the first time in the history of our world, that action has failed to correspond to a high sounding manifesto. There is no need of suppressing it, for the author himself of the Rational Psychology makes no efforts at concealment, that in his view, all past labors in this field of the science of mind, are now superceded, and what has been hitherto chaos and emptiness and desolation in the universe of thought and feeling under the touch of his omnific reason, is reduced to order and beauty; light streams through all its realms; darkness and doubt have taken their everlasting flight, though here and there one only of the sons of men have shouted, and perhaps but a single one of the foolish schools have bowed and sung the new creation.

We suppose that when Dr. Johnson said that it was unnecessary to eat through a shoulder of mutton to know whether it was tainted or not, he may have felt a little gruff, or been mantled with a kind of sardonic smile, as when in his great dictionary he solemnly defined oats to be a grain which in England is generally given to horses, but in Scotland supports the people. We certainly would set down nothing here in malice, or under the impulse of an unthinking prejudice, while we fully believe that for the purposes of this review it will be unnecessary to devour the whole shoulder in order to have a true flavor of the viands served up in this book.

We are not unaware, however, of the high estimate that has been placed upon these excogitations of Dr. Hickok. The *Bibliotheca Sacra* of April, 1859, must surely have felt no small degree of enlargement of some kind, otherwise it could not have delivered itself in panegyrics and supplications as it did in its review of these oracles from the subjective sphere. The writer of that review, after representing the rational psychol-

ogy and cosmology as the highest and most permanent type of American thinking, and predicting that if ever American philosophy is to have a history, the course of its stream and the bulk of its waters can appear in no other channel than the one indicated by Dr. Hickok, thus concludes the grateful strain: "It now remains for the author of this philosophy to give a theology whose principles shall be as absolute as those which prevail in the works before us."

What, then, are some of the principles, positions, or doctrines of this new oracle in the field of psychological inquiry?

1. Its assumptions in reference to what constitutes the true method of science, if not a novelty in the schools of philosophy, is here, as we think, made an absurdity too palpable to bear repetition. We have been accustomed, in our processes of generalization and discovery, to collect and arrange facts, and upon a close inspection of all the phenomena within the range of a careful observation, to infer the law that underlies and controls their development. It is this method that has carried the science of modern chemistry to such a height of perfection, that is advancing every department of natural history at the present moment with a rapidity of progress never before attained. Modern astronomy could not have been what it is today, had any other method been pursued in the investigation of those illimitable fields of space that have been compelled to pour on our vision their wonders by the power of our great reflectors. Physiology and a genuine science of medicine have never made any progress in any of the periods of the world's history by the the adoption of a different process of inquiry. Indeed the department of human inquiry can not be named, even psychology itself, in which a genuine progress has been made, save in the inductive or the analytic method. But this author assures us, that if we would attain any thing that really constitutes science, all our processes of inquiry must be remodelled, and not remodelled merely, but reversed and abandoned. Hence in almost the beginning of his book in telling us what rational psychology is, he affirms "that in the science of psychology it is assumed that we pass from the facts of experience wholly beyond it, and seek for the *rationàle* of experience itself in the

necessary and universal principles which must be conditional for all facts of a possible experience."

We must first determine how an experience can be from those *a priori* conditions which render all the functions of an intellectual agency intelligible. We seek to determine, "how it is possible for an experience to be from those *a priori* conditions, that underlie experience itself." The question with this author has no reference to what is, what are the facts in perception, in the understanding, nay in the reason itself, but what is the subjective idea of the reason, of the understanding and of all sensation, so that we may know that either are possibilities and be able to affirm of it all, not that it is, not that it is a fact of the consciousness merely, but that it must be. In other words there is no such thing as science in psychology or in astronomy or in any department of human inquiry until the subjective idea unfolds itself in the objective law and affirms of it all, not that it simply is, but that it must be.

It has been generally supposed that Kepler had some ideas of the science of astronomy, and that he did something to advance this science. It has been generally supposed that his observations on the orbit of Mars, which enabled him to demonstrate that its orbit was an elipse, with the sun in one of the foci, and that the same was true of all the orbits of the other planets also, was in fact his first great step in his truly scientific discoveries. It has been supposed that a second great step was taken by him, and taken scientifically too, when he had demonstrated that the radius vector, or the straight line joining the sun and Mars described equal areas in equal times, and that the same is true of all the planets in the solar system. And further still, it has been supposed that he made some slight approximation to a little science, when he announced the law that the squares of the periodic times of the planets are proportional to the cubes of their mean distances from the sun. It has been generally believed that these three great laws of planetary motion were not only discovered as facts, but demonstrated by a process of thinking or of reasoning that place them forever in the rank of scientific truth. But no, says our philosopher to all this. This is mere formal astronomy. There were seven observations on the orbit of Mars, before its elliptical character

was determined. How many before the other laws were demonstrated, we do not know. These were results of experience. All this is empirical knowledge. In this process, through experience, we are competent to affirm that so the solar system is. So are the appearances, movements, so are the satellites and such are their relations to their primaries. Such are the apparent changes of figure and of place in some, and the occasional transits or occultations of others. The sun is apparently in the centre, though this is not certain, as its subjective idea and objective law have not by supposition been yet found. The planets appear to move in orbits around it, with the direction, distance and time of periodical revolution accurately determined.

Indeed a diagram of the whole material heavens and earth may be thus made from the results of experience alone; but it will be empirical knowledge; it will not rise to the dignity of cognition. There will be in it all no science. In this state of things, all that can be affirmed of it, is, so the solar system is or appears to be. "But," now says our author, "if on the other hand, beyond experience, we may somehow attain to the cognition of an invisible force, which must work through the system, directly as the quantity of matter and inversely as the squares of distance, we shall be competent to take this as an *a priori* principle, determining experience itself and quite independently of all observation may affirm so the solar system must be."

Now the supposition, as in the case before us, that there can be a conflict between the facts of experience or of observation in this way and what is here called the *a priori* principle or force of gravity, which controls, shapes or directs all the phenomena of the heavens, is absurd, and equally absurd to suppose that this cognition, this subjective idea, this *a priori* principle, necessary and universal though it be, can ever be reached by the human mind in any other method than by the tentative, empirical or experimental process of inquiry; or in other words, by the changeless method of induction. In reference to mathematical science, all know that its truths are necessary and universal. The three angles of a triangle, whether lying in a diagram before you on your table, on the fields of the earth, or on the plains of the firmament, can never be less or

more than two right angles. But this truth was reached, like all others in the field of demonstration, by a succession of judgments that ultimately resolved themselves into axioms or first truths, that admit of no proof or demonstration.

We admit, therefore, that there are necessary and universal truths, that the whole field of the pure mathematics is of this character, and that it is true of all those branches of philosophy where these results are affirmed by the processes of a rigid demonstration. But that the method in which these results are reached is *a priori;* that it depends first on a subjective idea as affirmed by the author of this book, we shall deny and continue to deny so long as assertion is not proof, or declamation argument.

2. But, again, the position which this treatise assumes in reference to the philosophic doctrine of perception itself must, so far as its influence goes, throw scepticism and doubt into the whole region of philosophy and morals. It has always been admitted that the connection between the external world and the universe of thought and feeling in the human bosom, is unknown. There have always been efforts, since man began to reason and philosophize, to fathom this hitherto unsounded depth, and leave the problem of this connection no longer unsolved. What resemblance is there between the picture of a landscape inverted upon the retina of the eye and the thought of a landscape? Why is not the thought itself, or the sensation inverted? What is the proof that perception itself in this case is not an illusion, as we know the erect position of all the objects of vision is exactly the reverse of these pictures on the retina of the eye itself? So in the sense of smell, what resemblance is there between the sensation of fragrance and the particles of matter from the rose that impinge on the olfactory nerves, and give rise in the consciousness to the fact of fragrance? Do we see the objects themselves directly in vision? Do we perceive them at once in taste and smell and touch, and hear any thing but the vibrations of the atmosphere in sound?

Now some of these questions have only to be propounded to reveal at once the state of human knowledge on the whole subject of perception or the reality of an external world. How do we perceive at all? The question has been often asked, and the

theory of occasional and efficient causes introduced to solve the problem. The picture inverted on the retina of the eye, of the tree, the landscape or a friend, is the occasional cause of these respective sensations, that is, no cause at all, while God here interposes and by a direct efficiency produces in the mind the sensation of the tree, the landscape or the friend. Thus, we do not know whether there be any tree, or landscape, or friend at all; for God can just as well impress on the mind the sensations of these objects without the pictures on the retina, or without the organ of vision itself as with them, for, by the supposition, they have no efficacy, no efficiency in the production of the mental phenomena of sensation. What is true of vision in this way, is equally true of all the five senses.

Again, the old theory of perception that obtained from the days of Aristotle and passed unquestioned by Locke till the time of Reid, only made the darkness on this question equally, if not still more visible. In sensation the mind perceives no object that is external to itself, but only images, forms, species, phantasms or representations which impinge on the organs of sense as on the retina in vision, the olfactories in smell, the tympanum in hearing, and in some unknown way are conveyed along the nerves to the throne of the invisible thinking personality within. This theory our author on the whole, rather favors, as it subserves most effectually the ends which he proposes to accomplish. Of the truth of this theory of perception there never was any proof. It never shed any light, or bridged this chasm of inquiry. It was hypothesis only, without even the figment of a vision or a dream for its support. The philosophy of common sense, which has supervened upon these images, forms, species, phantasms, or representations that so long cast their shadows on the empire of mind itself, has won only a negative triumph in explaining this theory of perception while it leaves the process itself unexplained, or the problem unsolved. We suppose that the keenest and most exhaustive analysis of this subject in our language is that of Sir Thomas Brown, in which the muscular organs are shown to play such a part in the phenomena of sensation and in linking together the universe that is above and around us with the universe of thought and feeling within. Yet the problem, it

is admitted, remains without solution unless it be true as Dr. Hickock affirms, that the ponderous gates to this inner temple of the mind, on golden hinges turning, are now laid open by the touch of his powerful hand. But it is easy to see the sources, in the circumstances of this question, of the two opposite tendencies that have ever been exhibited in the philosophical thinking of the world. If the mind perceives only through the medium of a representative the objects of an external world, or if it knows absolutely nothing save the fact in its own consciousness, then the step to an absolute idealism is short and there is nothing in the wide universe but ideas. Berkley and Hegel themselves, are nothing but ideas, and Dr. Hickok and his book are only representations, images, ideas or phantasms dancing among the imaginary nothings of this nether world. After all, there are no fields of broom corn on the Mohawk, or cabbage patches on the Hudson. And the barefooted boy that stubs his toes, walks over a carpet of chestnut burs or into a bed of Canada thistles, will have to console himself with Dr. Hickok, that his very lively sensations are nothing but the purest idealism, unless he adopts his theory of the subjective idea and the objective law of all intellegence of stubbed toes, chestnut burs and Canada thistles. On the other hand, if thought in any form be nothing more than a transformed sensation, and sensation be nothing more than some material image, or representation of matter itself, then, of course there is nothing in this universe but matter, and the doctrine of an absolute materialism is demonstrated. Horace Mann was in the right, and his statue is justly placed in the State House yard. Such are the two tendencies. Idealism on the one hand, and materialism of the school of Hobbs and Compte on the other. Now it is the conviction of universal consciousness, that we perceive immediately the external objects themselves. This is in conformity with the philosophy of the school of the common sense. It has been taught from the days of Reid and Stewart and Brown, and no mortal, till he has become a philosopher and written a book, has ever called it in question. Now hear the conclusion of this whole matter from Dr. Hickok, the Apollo of the transcendental sphere.* When

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the unexamined convictions of consciousness, as direct for the immediate perception of an outer world, are brought to the test of a philosophical investigation, the demonstration comes out full, round, clear, that all such immediate knowledge is impossible. No body knows that there is any such being as Dr. Hickok, or thing as his book, though they may think and believe fully that they have seen both. The demonstration, he assures us, comes out full, round and clear that all such immediate knowledge is impossible. Who knows, then, that there is any such person as Mr. Jefferson Davis, that there has been any rebellion in these United States, or battles on the Mississippi, at Antietam or Gettysburg, or fall of Charleston or of Richmond? Is not the boy in the briars and brambles, after all, mistaken as to any immediate action of the external world on his sensational susceptibilities?

Under the test of the philosophical investigation to which things are brought in this book, the demonstration comes out full, round and clear, that all such immediate knowledge is impossible. The very sensation, continues the author of this celestial philosophy, through which the knowledge is given, is wholly mental, and at the most can be determined as only representative of the object, and not that it is that object itself. At the most, then, it is only a representative of Mr. Jefferson Davis, and of a rebel army facing Generals Grant and Hooker at Chattanooga and Richmond; it is wholly mental. It is demonstration, full, round, clear. It is not possible to affirm beyond the immediateness of the organic sensation; and all that can directly be known is, that the mind has such sensations, and this it may deem to be a perception of an outward object; but the reason attains the irrefragable conclusion that the sensation only, and not the object as external, can be immediately in the consciousness.

A demonstration of reason thus concludes directly against the testimony of universal consciousness. They are each independent sources of human knowledge; unhesitating conviction must follow a clear decision of either; and yet here they openly and flatly contradict each other. The nature of man as intelligent stands out a self-contradiction. From the very light which is within us, we are made to conclude that light itself is

darkness, and thus all grouud for knowledge in any way is self-annihilated. And now where are we as intelligent beings? Consciousness contradicts reason; the reason belies consciousness, and thus all ground for knowledge in any way is self-annihilated. If all this be so, then the world must be very much indebted to our philosopher for this information, and yet in conformity with his own showing, if this light from the transcendental sphere, revealing the mighty realm of contradictions and darkness in the human mind, should become a sensational phenomenon among men, it would be wholly mental and at the most can not be determined as having any objective reality or ground. It is not possible to affirm any thing of this conflict, or darkness beyond the immediateness of the organic sensation. If it be, as our author affirms, a universal scepticism must reign in the whole realm of philosophy and morals. From this position, sustained by the author, this result must issue without the possibility of an escape.

3. At this point it may not be inappropriate to advert to another fact which the perusal of this work forces on the attention. It studiously ignores all that has usually been classed under the general designation of mental intuitions, primitive beliefs or ultimate facts in the world of matter and of mind. It has been cheerfully conceded that sensation does not give the idea of personal existence, does not give the *Ego* and *non Ego*, the me and not me, but that it springs into being as the condition of thought itself. In the same way the reality of an external world rises on the thoughts, of personal identity, the idea of cause, of an immutable distinction between matter and mind, the idea of the existence of matter as the resting place of certain qualities or properties that affect the organs of sense, extension, figure, solidity, divisibility, color, weight, etc., the idea of the existence of a mental substance, the abode in which thought and feeling and all the activities of the mind inhere; also the ideas of time and space which are infinite in extent, and carry with them the conviction of necessity and universality.

It has been admitted that our mental powers in this way are conditioned in their exercise, and that these limitations or conditions give rise to an important class of our ideas, designated

mental intuitions. The characteristics of these intuitions have been marked with a precision that leaves nothing in this field of inquiry to be supplied. McCosh, therefore, in his discussion of them, has only obscured and mangled the language of Brown without making them any more clear or palpable to the apprehension. Brown has defined a mental intuition to consist in the possession of three inseparable characteristics. Every conviction that possesses these characteristics is a primary belief, an ultimate fact, a mental intuition beyond which all inquiry is utterly useless and vain. Every such conviction is irresistible, immediate and universal. A man cannot disbelieve in his own existence, if he would, in his own personal identity and moral responsibility for any act of crime committed last week, month, year, or years since. He cannot disbelieve in the reality of cause and effect, of substance material and spiritual, of time and space, and the existence of an external world arrayed in grandeur and garnished with beauty. The mind does cognize the infinite as well as the finite, the unconditioned of which the infinite and the absolute are but the species.

It is said by Sir William Hamilton in his famous article on the philosophy of the conditioned, that the human mind can not cognize the unconditioned, can not know the infinite, can have no cognition of the absolute, and therefore, God himself can not be known by the human mind except by pure faith, that is not known at all; and hence the current of scepticism that is following in the wake of these speculations. We can know, he says, only the finite, the limited. If we must use the term here employed, we can have a cognition only of what is conditioned, finite, in relation, dependent. But we can have a cognition of a mile in length, ten miles, perhaps more. But who has a cognition of the distance of the ninety-five millions of miles between the earth and the sun, or the enormous distances of those orbs in the realms of space, whose light has not reached us though it has travelled since the fair morning, when over our own creation, the angels of God shouted and the morning stars sung. All this is finite and Sir William admits that we can have a cognition, or that our knowledge of it is real, reliable. But if it be real, reliable, it is not exhaustive in reference to the finite itself, and therefore, ought to be,

according to this theory, nay must be, a matter of pure faith. The truth is, we can have a cognition of God which is just as real, reliable, as we have of the orbs of heaven in their respective distances from the sun. Our cognition in either case, is not exhaustive, but it is a knowledge that is absolute, real, and not a matter of faith in any sense. The whole cope of heaven can be condensed and mirrored forth from a rain-drop, and so the God of heaven in all the elements of his mental and moral nature, can be seen and known in the creature man. From the rain-drop, man, the mental and moral image of the "King eternal, immortal and invisible," is reflected in all its elements, so that man himself has of it a cognition, as absolute, real and reliable, as he has of his intimate friend and acquaintance. These mental intuitions lead the mind upward to the infinite and absolute Creator, attributing causality and personality, investing at once the Godhead with all that is matchless in pertion and glory. But all this is utterly ignored in the discussions of our author, in order that the reason, whose functions he would exalt in our mental economy, may fill the throne.

4. On this power, faculty or function of the human mind, the author bestows his attention and expends all the force of his energies. Its place in his system should be surveyed and the prerogatives claimed for this transcendent power, that is to illumine the palpable obscure in the mental firmament, canvassed. Says Prof. Seeley, a particular friend of the author and an expounder of his theory: "In distinction from the faculty which can affirm one thing because of another, and which, in that it must stand something under every affirmation, is properly termed the understanding, Dr. Hickok recognizes in the human intellect a far loftier capacity, whose province it is to behold the truth by an immediate insight and in its absolute and self-affirming ground. This higher faculty, in that it, through the visible symbol, can read the truth invisible to any eye of the sense, or the understanding, is fitly named the reason." This distinction between the reason and understanding, says this disciple of the philosopher, is fundamental in his thinking, and that it will be a great mistake to suppose that it means no more with him than that distinction in similar terms

which is so prominent in the critical philosophy of Kant, and he might have added Coleridge and some others.

Dr. Hickok's doctrine of the reason, therefore, according to his expounders, differs from that of all others. It is his own, and has nothing like it in the heavens above, nor the earth beneath. All this will be conceded. At least, we shall not dispute it. In his views, this is a faculty which differs as truly in kind and not merely in variety or degree from all others, as that which is truly spiritual in man, differs from the animal part of his nature. This ought to serve as a kind of preparation for the great light that is to be shed on our paths from the philosophical Elysium itself. Enceladus is about to change his sides and of course Ætna itself and all Trinacria, if not the world, may be expected to be moved. The nature of man, says the writer of this book, as intelligent, stands out a "self-contradiction," and the truth of an intellectual nature is itself a falsehood.

The Rational Psychology, therefore, begins by questioning all experience, all consciousness, and even calls in question the full, round, clear demonstrations of reason herself, for the subjective idea of reason itself, must be sought in some *a priori* Serbonian bog or ground, or chaos bottomless. We do not yet know that sense or reason or experience is possible. Here then the beginning is to be made. The pure reason, even before she knows the possibility of her own existence, beholds, "an eternal principle as if before all worlds or minds were made."* The principle, says Dr. Hickok, must be an ultimate truth, which, in the insight of the reason, is given as having in itself necessity and universality and which is conditioned by no power, but must condition all power. It is thus no fact or thing made, but an eternal truth which in the reason determines how things must be made. Reason itself, therefore, is not created, not made, is an ultimate truth, an eternal principle having in itself necessity and universality, is conditioned by no power not even that of God himself, but must condition all power, even that of "Him who is and was and is to come."

How does this lofty capacity which is to itself its own light, independent, unconditioned essence, itself a bright effluence,

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increate, operate in the exhibition of its subjective powers to our world? We can give here only a very brief outline of what is said to be the method of its action.

In the psychology of Kant, Cousin and Coleridge, time and space are ideas of the pure reason. We can, for example, imagine the book we hold in our hand not to exist, the chair, the table and every thing in the room not to exist, but we can not conceive of the non-existence of the space that is fenced off by the walls of the enclosure. In this way we may suppose the house itself not to exist, the earth itself not to be, and all the orbs of heaven to have sunk in the abyss of annihilation; but we can not conceive of the non-existence of the space in which they roll. This is designated a truth of reason. It is a necessary conviction of the mind. It is universal, infinite. It is not a truth of the understanding, but of the reason in distinction from the understanding or the discursive power of judging.

In the same way, in a succession of events or of phenomena, there arises the idea of time. You can suppose the succession of events not to exist, but you can not conceive the non-existence of the time in which the events themselves transpired, or the phenomena occurred. Time, therefore, is the place of events as space is the place for matter in all its forms. They are both ideas of the reason. They are both necessary, universal, infinite. Adam Clark assumes that time and space are attributes, qualities, and that there is, therefore, a subject in which they inhere, and that the subject itself, therefore, is the infinite God. This constitutes the famous *a priori* argument for the Divine existence, which, after all, leaves the whole question resting on a groundless assumption. For there is no proof that time and space are properties or qualities of any thing whatsover. These philosophers, who have admitted thus much, in reference to the faculty of reason in distinction from the understanding, have never claimed for it what is now affirmed of it in the treatise before us. These characteristics of it, as now affirmed, are original, and the author of this system is fairly entitled to all the honors of the distinction, if distinction it be.

The subjective idea of reason in its development of form, which means, of course, the limits of extension in matter, ac-

cording to our author begins in this way. And let no man, if he have any tears, be lavish with them now, or be startled as this Mercury of the reason binds on his winged sandals and descends to the peaks of the Atlas, or as this Raphael of reason from the highest heaven, comes down and appears to the philosophers of earth, like "another morn risen on mid-noon." The reason has activities of its own, says our author. In the spontaneity of its own functions, it moves through the void in pure space, constantly within the intuition, but let no one ask what this means, and is thus perpetually and directly beheld in all its progress. Well, this agency, this activity, this spontaneity of the pure reason, in this field of space, in its primitive intuition, makes a point, takes a stand in this idea of space, occupies a point in the intuition. The void, says the author, is no longer empty. The εἰζεντλάττειν power is now at work and will soon have things in shape as to these forms. This agency, activity in spontaneity, moves backwards and forwards, takes new positions, assumes new points, all in this field of intuition, in this realm of infinite space which is diversity itself, because any number of points can be taken in it. This agency brings the diverse points taken into conjunction, and makes its own pathway precise and plain by collecting into itself the points of a continuous contiguity. Here, then, is a definite real form or product of this activity of the reason, this agency in spontaneity. This is the starting point in the subjective sphere, says our author. Here a definite real form, a mathematical line, appears. And this line formed all other lines and surfaces spring at once into being in the region of pure space in ideas, and thus become the *a priori*, or subjective ground of all possible forms which fill the fields of space with their crowded exhibitions. The same is asserted also of time, which we will not here repeat. The assertion is, that in the primitive intuition of pure space and time, nothing is conjoined, and thus no product can be cognized, because nothing is produced. Such possible product is the result of the constructive agency of the eternal principle itself, the form producing faculty and must be effected by conjunction.

The elements of an *a priori* operation of conjunction are these. In the first place, the conjunction itself occurs after this manner.

The intuition makes point one, and one, and one in space and time, but this is no product. But one and one are two, and two and one are three, and so on, forming a conjunction in the transcendental, subjective sphere, and this conjunction possessing the elements of unity in diversity, unity in plurality, unity in totality, and unity in quantity, becomes the primitive elements of all possible forms or the subjective idea of all possible forms in pure space and time. Here we have the subjective idea of the objective law of all intelligence of possible forms in time and space. Then, there is superadded to this, distinction, reality, particularity, peculiarity, quality, unity of self-consciousness in order to complete the subjective in the empirical intuitive, or in order to realize the subjective idea of forms in space and time by anything objective or separate from the mind itself. All this is necessary, and more which we will not here detail, in order to know what shape a world can be in, a house built, a fort constructed, men made upright in position, how a cravat or a stock can be fitted, a shoe made, or a bonnet or a piece of crinoline can be fashioned and worn. All this must be done to know that there can be in mathematics such figures as triangles, squares, parallelograms, prisms, cones, pyramids, cylinders, spheres and cubes, etc. All this speaks for itself and gives a glimpse, though a feeble one it is admitted, of the beauty and glory of the subjective or transcendental sphere.

We may add, in this connection, that this process of inquiry is carried through all the forms of sensation, all the judgments of the understanding and of this lofty reasoning power itself. It spreads a bolder wing and enters the secret places of creation itself and dares to lay its hand on what it conceives to be the process in which matter itself and the worlds were made. Matter, it declares, is the result of the activities of the infinite God in counteraction. This of course will seem strange language to be employed on such a theme. How can the activities of the Deity ever be placed in counteraction? We are to remember that reason in this system is invested with lofty functions. It is an eternal principle, itself absolute, necessary, universal, unconditioned, while it conditions and limits all things else, even the Being who speaks and it is done, who commands

and it stands fast. Of course God himself may come in counteraction with such a power and whenever he does, is the declaration of this philosopher, the result is the creation of matter, and of all things else in conformity with the subjective idea, the eternal forms and patterns and archetypes, that are given in the reason itself. Illustrations are given in the volume before us of the cosmogony of worlds, which resembles to our apprehension the Monbodo theory of man developed from a tadpole. After the melting of the pencils of ice that are given to illustrate the generation of matter and the thousand forms of beauty and grandeur it assumes, we could not really tell ourselves, though others may be more fortunate, whether we were in the body or out of the body, while we were very sure that we were not in the third heavens. To us we confess, its arrogance seemed matched only by its presumption, and its daring only by its absurdity. Yet the style of composition throughout this work, in its diction, is pure, chaste, classic, if you please, elegant, tasteful, and is eminently suited to philosophical discussions.

The treatise itself must have exacted from the author a tribute of thinking and of toil in writing, that must have been sometimes a severe ordeal to flesh and to spirit. It is the result of the study of the choicest years of a life, and its fruit ought to have been nutritive to thought, useful in marking the true courses of philosophic investigations, and not subversive, as it is, of the very foundations of scientific knowledge in all the departments of moral and religious inquiry. It treats with utter contempt all the treatises on natural theology in our language, and regards them not merely as worthless, but as misleading the human mind in reference to the true methods of a sound and rational investigation. All the Paleys, therefore, and the writers of the Bridgewater Treatises, would have spared their labors doubtless, had they lived in the days of this modern philosophizer and opened their eyes on the sun of the pure and rational psychology.

ARTICLE II.

THREE THOUSAND MILES UP THE MISSOURI.

BY W. BARROWS, ESQ., DAVENPORT, IOWA.

Our wanderings last year in Idaho and Montana, our safe return to the States, as published in the March and May numbers of this Review for the current year, were made by the overland route. This year, not only for a variety of scenery and a more comfortable passage, but for safety from Indian depredations, we made the trip by steamer on the Missouri River to Fort Benton, the head of navigation, and thence across the country two hundred and sixty miles to Virginia City in Montana Territory, the place of our destination.

Our company was a pleasant one, made up of a few ladies going out to join their husbands in the mining districts, making in all a company of about forty, including some children. We had under our special charge four of these ladies and some children, just enough to establish a responsibility in travelling a distance of more than three thousand miles, consuming three or four months of time, and passing through a country infested with bands of guerillas and Indians.

Ample stores being laid in for so long a voyage through an uninhabited country, we left St. Louis on the morning of the 18th of March, 1865, on the steamer Bertrand, receiving the silent adieus and last sad looks of friends as they stood upon the shore, to see our little pioneer band cast off for the long and dangerous trip.

More than sixty years ago a similar scene was enacted upon the same spot by the intrepid and fearless explorers, Captains Lewis and Clark, with their hardy band, the first navigators of this river. With the exception of a few hundred miles, the country was then unknown to them, but with their Mackinaw boats and light batteaux, they entered on their toilsome journey, yet with many doubts and fears.

It was a beautiful spring morning for us, and but for the parting scene all on board was full of life and hope. Our little Bertrand glided away from friends and home like a thing of life. A voyage to Europe is of common occurrence, and the track of

the ocean is wide and free from rocks and quicksands, but this inland steaming of three or four months upon the crooked, muddy, snaggy, boiling Missouri, is full of hazard, tiresome, and almost endless in its passage.

We simply propose in this paper to give incidents by the way, a description of the Upper Missouri, the Indians who inhabit the country through which we pass, its military and trading posts, and some thoughts on the geological features of the Rocky Mountains, where our noble river begins its life. As it will serve our convenience, so it may somewhat enhance the interest of the reader if we allow our narrative to take a little of the journal form and of the present tense in statement.

Except in very high water, the Missouri is not navigated at night, steamers generally tying up to the shore. The channel is constantly changing and the banks continually falling in. The pilot of last year is obliged to seek a new channel this year, and often compelled in low water to make his soundings from the small boat, and feel his way over new grounds and into new depths.

We passed the town of Lexington to-day, March 22d, located on the western bank of the river, and once a beautiful, thriving city. It was partially destroyed at the beginning of the war by a raid on it from Price and his army. A severe battle was fought in which the Union troops were compelled to retire. Many valuable houses were burned, and the town nearly destroyed.

This portion of the river is now infested with bands of guerillas, who are nightly committing depredations on the settlers, driving off their stock, and robbing and murdering the citizens. Fears are entertained of an attack on our boat, and we are on the constant watch against surprise, anchoring out in the stream at night, and keeping up a strong guard. Our passengers are all well armed, and the boat has forty Enfield rifles well loaded, a thousand rounds of ammunition and a small cannon, furnished us from the State Arsenal at St. Louis, as a protection against guerillas and Indians.

A few hours brings us to Leavenworth City, a beautiful and growing place on the Kansas side of the river, two and a half

miles below old Fort Leavenworth, one of the first military posts on this river.

The willows, the first monitors of spring, just begin to show their buds, and the gently sloping bluffs around Leavenworth are putting on their green attire from the early sprouting of the blue grass. Stern winter has cast off her snowy mantle, and spring, the most joyous season of the year, is just beginning to awaken from her long slumber. We can now come on deck, look about into the early dawn and drink in the beauties of the wakening day. It is true the blue bird has not come, and the songsters of the forest have not begun their glad notes, but we can inhale the freshness of nature, and quaff with delight the first breeze of spring.

Passing Kansas City and the mouth of that river, with some little towns upon either side, we come to St. Joseph, a flourishing city on the eastern bank of the river, connected with the Mississippi by railway to Hannibal and Quincy. This place was once a great outfitting post for the Santa Fe trade, and overland California emigrants, the fur trade, etc. It contains many fine buildings both public and private, with a population of some six thousand.

Council Bluffs, a place of some five thousand inhabitants on the Iowa side of the river, and about three miles from the landing, greets us on the 30th of March. This was the old Mormon town of Kanesville, and is now a very thriving city, having a large farming country around it, well settled.

Omaha is located across the river about five miles above, and is one of the best situated towns on the Missouri River for future prospects. Its position in regard to the great western thoroughfare is good, being on a direct line with Chicago, Davenport, DesMoines, Council Bluffs, Fort Kearny, Salt Lake and California. The Union Pacific Railroad commences here, one hundred and ten miles of which is to be finished by the 1st of July, 1866. Omaha now contains about five thousand inhabitants and carries on a flourishing trade, not only with its home population but with the Colorado, Idaho, and Montana mines and Salt Lake.

This place we leave on the afternoon of the last day of March and tie up our boat at the little town of Florence, Nebraska,

the same night. This is the remains of an old Mormon town, called Winter Quarters by them, it being the place of gathering for that body, preparatory to crossing the plains for Great Salt Lake City, the home of the Latter Day Saints.

We left here at daylight, and at three o'clock in the afternoon, when about fifty five miles above by water and twenty two by land, our boat, the new and pretty little Bertrand, struck a snag on her larboard side and in less than five minutes went down in twelve feet water. The most of the passengers at the time were lounging on their berths, or sitting about the boat, reading and conversing. Thus in a moment as it were, our peaceful little home was changed into fright, confusion, and al. most despair, our plans for the future were all changed, and each was eager to save himself from the muddy waters of the Missouri. It was a beautiful afternoon, and we were sailing along with hopes of a quick passage, not even dreaming of disaster, but in five minutes, some had lost their all, and others such articles as were indispensable for the trip.

The Missouri River, from its constant changes in its channel and the caving of its banks, carrying with it trees whose roots soon become fastened in the sands on the bottom, is a river of snags. The tops of the trees are soon worn and broken so that they become pointed, and always lying with the current, they are elevated in general to the surface. Sometimes the whole tree becomes submerged and out of sight. This was the case with the one that the Bertrand struck. It was a submerged log. The scene on board for a time was very exciting. Ignorant of the depth of water in which the boat lay, and the depth to which she might go, all were at a loss what to do. She soon struck bottom and commenced to careen over into deep water, when the chairs, tables and other furniture of the cabin were thrown to one side; glass ware, crockery, skylight windows, and glass doors of the cabin were broken as the creaking, laboring vessel was parting and straining her timbers in rolling over. The screams of women and cries of children for a time passed description, and can be understood only by those who who have experienced such a disaster. Many jumped overboard and swam for the shore, others made their way as best they could

for the hurricane deck and pilot house, while others stood in mute despair, speechless and powerless.

The scene was soon over, and the boat rested on a ridge of sand in water twelve feet deep and running off into twenty feet on the starboard side, being about thirty feet from the shore.

The boat's yawl was got ready immediately after she struck, and a line made fast on the shore, when it returned and commenced taking off the passengers, who had gathered upon the bow of the boat. The gang planks were soon floated to the stern, and a staging made from the guards of the ladies' cabin to the shore, when all were taken off in safety, and landed on a sandy beach, four miles from any inhabitants or shelter.

We were on the west, or Nebraska side of the river. The little town of De Soto was some five miles distant. A runner was sent for teams to convey the passengers to a place of shelter for the night, while others were soon engaged in erecting temporary shelter for such as were obliged to remain.

A few of the ladies and children were sent off before night, but the greater number of the passengers remained upon the ground. The crew of the boat were soon at work removing freight from the wreck, out of which the walls of rooms twenty feet square were soon made and covered with tarpaulings. Carpets and furniture of the boat were brought on shore, and bedding from the state rooms, some stoves set up, and the people made comfortable for the night.

The cook house, being on the boiler deck, was not submerged, and its stove and fixtures soon erected on shore and in full operation. There were ample boat-stores saved, and a good supper was smoking upon our dining table before the sun set.

No goods stored on the boiler deck or in the ladies' cabin were wet, except such as rolled off when the boat careened; but the freight on the main deck, and in the hold of the vessel, about two hundred and fifty tons, mostly groceries, was nearly a total loss. The boat, valued at forty thousand dollars, was partially insured, and the freight generally. All was turned over to the Underwriters on Insurance, who must have lost two hundred and fifty thousand dollars.

In about five days, the steamer U. S. Grant, belonging to

the same company which owned the Bertrand, came along, and all who could, and desired, were reshipped on her for Fort Benton, with such of their effects as were saved from our unfortunate boat. She became a perfect wreck.

We returned to Omaha with the ladies and children in our charge, where they remained with friends until we returned to St. Louis, purchased another stock of goods, and shipped them on the steamer Roanoke, with nearly the same officers and crew that were on the Bertrand. She left St. Louis on the 2d of May, and on the 13th we all took passage again at Omaha for Fort Benton.

On this boat we have some thirty passengers, with a freight of about two hundred and fifty tons.

We passed the wreck of the Bertrand this afternoon, May 14th, and also the wreck of the steamer Cora, snagged five days since, and a total loss; though no lives were sacrificed.

We passed the wreck of another steamer to-day, the 15th, the E. O. Stanard, snagged yesterday, and took off some of the passengers, of which she had about forty. Also passed the R. P. Converse with shaft broken, thirty days out from St. Louis, bound for the Mountains. These boats were all bound for Fort Benton with heavy freights and passengers. Boats sunk in the Missouri generally become a total loss, as they fill so quick with sand that it is impossible to raise them.

We are now in the worst portion of the Missouri river for navigation. From Omaha to Sioux City, or to the mouth of the Big Sioux River, a distance of some two hundred miles, the river spreads over a large extent of country, varying in width from a quarter to a mile in width, and from one to twenty miles between its main bluffs. It is heavily timbered, its channel narrow and full of snags. When once above this section we are comparatively safe from snags, and the scenery on its banks grows more interesting.

One day more brings us to Blackbird's Hill, a beautiful point of bluff on the Nebraska side of the river. It is in the general range of the shore bluffs, but rounded up about two hundred feet above the general level, and overlooks the Missouri River for miles. It is celebrated as the grave of a noted chief of the Omaha Indians, called Blackbird. By his own command he

was buried there, sitting on his favorite war horse, which was enclosed alive in the grave of his cruel master. It was an act of barbarism on the part of Blackbird to exact of his tribe such a deed at his death; but the wily chief had something more in mind than Indian superstition. It was in keeping, too, with the many bloody acts of his whole wicked life.

The legendary history of this chief is obtained mostly from traders and trappers, and is endorsed by some of the patriarchs of the tribe now living, who have become civilized and Christianized. There are several versions of the story, but all tend, in the main, to the same end. Blackbird is represented as having been a man of ambition, cruelty and blood, fond of power, intrigue and full of subtlety, and would resort to any means however wicked to accomplish his ends. Whether his chieftainship was hereditary or not, he found it difficult to maintain his power and influence over his tribe in opposition to his political enemies. He resorted therefore to the scheme of playing upon the superstitions of his race, and turned prophet, proclaiming himself in communication with the Great Spirit, and professing to follow the directions of the great Kitch-a-Manitou of the Red Man. He became the intimate friend of the traders, and learned much from them, who are in general unscrupulous and unprincipled, to further his designs to maintain his power. He was taught the nature and use of poison and learned to use it, so that when his mandate was disobeyed, or his views interfered with by aspiring men of his tribe, their death was prophecied, and it was always sure to take place, and often at the time and place foretold by him. Thus he became renowned, was reverenced by his tribe, and feared by his enemies, reigning with savage tyranny over them until his death, in old age. It is said that he administered a dose of arsenic to the very man who had taught him its use. His ambition for power and his love of fame never left him, and when his aged footsteps were even on the brink of the grave, he prophecied his own death, appointing the day, and summoning his whole tribe to witness his demise, and assist at his burial. The day arrived and with it came sickness and sudden death. The directions given by him as to his burial were faithfully performed by his tribe. The place selected by him was the beautiful rounded

bluff we are now passing, rising above the general range nearly three hundred feet.

The tribe of the Omahas assembled at the chief's wigwam, situated in a little valley near by, and with all the pomp and splendor of Indian superstition they slowly bore the remains of their tyrant chief up the sloping sides of the hill of death, followed by his milk-white steed of noble bearing, richly caparisoned for the sacrifice. Amid the wailings and deep lamentations of his people, they brought him to his place of rest.

The warriors and principal men of his tribe now approached to decorate the body and prepare the horse for his living grave. The palms of their hands were painted over with vermillion, and stamped on the snowy sides of the passive and innocent victim, the totem of the chief was inscribed on the breast of the horse in rude but meaning characters. The scalps, taken in war, were fastened to the bits of his bridle, and all the paraphernalia of the Indian war horse were attached to the unsuspecting beas- that now stood fastened to a stake on the top of the mound.

The lifeless form of the chieftain, dressed in full warrior cost tume, was next placed on his back, and made fast by the fibrous strings of the bass wood. His bow and his arrow were place, in one hand, while his shield and quiver were slung across his shoulder. His pipe and medicine bag were placed in his left hand, with the flint and steel, that he might smoke on his way to the good hunting grounds.

A pouch of dried buffalo meat was hung to the saddle bow, that he might not be hungry on his way. On his head waved the glossy plumes of the bald eagle, while his leggings and moccasons were wrought in most exquisite skill, with the colored quills of the porcupine and the finest fibres of the Indian moss tress. Thus prepared, the ceremony of burial commenced. A wall of turf and rock was built up around the unsuspecting animal and night and the solemn work went on, until the light of day was shut out from the doomed victim of superstition and ignorance. The work was completed, and the noble war horse left to die by starvation, bearing his barbarous master in dumb and dismal silence, to gratify a vain ambition, and leave a name that should be handed down to posterity as great. We visited this spot many years ago, when the story was told us; and while the

remains were yet fresh and visible. To this day the Omahas keep the place sacred by a white flag raised on the top of the mound, showing the last resting-place of the great chief, Blackbird.

This tribe of Indians still occupy a strip of land along the river eighteen miles in length and ten wide. Their village and mission grounds are but a short distance from the mound. They number about one thousand, are somewhat civilized, and have a school and church. Fifty children are allowed instruction at the mission school, which is under the superintendence of the Old School Presbyterian denomination. This is called the Omaha Reserve.

The Ponka Indians, about a thousand in number and now living upon a reserve some two hundred miles above on this river, were once a part of this tribe; but, owing to some difficulty, a division was had, and a portion of the tribe followed the chief Ponka.

The Winnebago Indians, originally from Illinois, then settled on the Neutral Grounds of Iowa, from which they were removed to Blue Earth River, Minnesota, are now living with the Omahas. At the time of the Minnesota massacre by the Annuity Sioux, the Winnebagoes were supposed to sympathize with them, and the settlers becoming suspicious, they were removed with the Sioux to their Reserve one hundred miles above Fort Randall.

They became dissatisfied in living with the Sioux, and a delegation visited the Omahas last fall, when arrangements were made between them for a permanent residence, subject however to the sanction of Government. We met the last emigration of them this day, about twelve canoe loads, on their way to the Omaha Reserve.

These several tribes have had their numbers so diminished by wars with the Sioux, the Pawnees and other tribes, that they can no longer venture out to hunt the buffalo and other game, and are compelled more from the force of circumstances than the love of it, to adopt civilized life, and the pursuits of agriculture for a living. We knew the Winnebagoes more than twenty years ago, when their mission and school were flourishing under the superintendence of the Rev. David Lowry at Fort

Atkinson on Turkey River, Iowa, and are compelled to say that their improvement, as a tribe, in civilized life, is truly discouraging.

We passed to-day, May 18th, Sargent's Bluffs, located above the mouth of Little Soldier River, and just below Floyed's River.

One of the most elevated and picturesque of this range of bluffs has become noted as the spot where Sergeant Floyed, one of the early pioneers up this river, was buried, and is known as Floyed's Grave. It is upon the east side of the river, in the State of Iowa, and only five miles below Sioux City.

In 1803, more than sixty years ago, when the border settlements of Missouri extended but little above the mouth of the river, and St. Charles was an out-post, Lewis and Clark were sent by our Government to explore the Missouri and its tributaries, the Rocky Mountains, the Columbia River and the shores of the Pacific, an undertaking at that day considered hazardous in the extreme. It was at this place that Sergeant Floyed, one of the company, died, and the body was carried to the top of this bluff and buried. In 1855, while on an exploring tour in the North West, we visited this spot, and found the cedar post yet standing that was placed at the head of the grave. Though somewhat decayed, we hewed off portions that were sound, and preserved them as relics, showing the durability of the red cedar, it being fifty two years old. The entry upon the journal of Lewis and Clark on the occasion was that Sergeant Floyed was a "worthy man and a faithful soldier." Fifty long years have rolled away since he was laid in his lonely grave amid the solitude of the wilderness, with no human voice to break the dismal silence, or speak the name of the sleeper on this beautiful bluff.

Of how little importance was the expedition of Lewis and Clark considered at the time, even by our Government; and how poorly rewarded for all their trials and sufferings by the old fogy administration of that day. Government even refused to publish an account of the expedition, and copies of it are scarcely to be found in any public or private library. Never was an expedition made that opened up to the world an unknown country of such vital importance as this. It revealed

the numerous tribes of Indians and their condition, never before known, and rivers and mountains that have since become renowned and valuable for their mineral wealth.

The description of country through which they passed is so accurate and definite that none can mistake their great landmarks, especially on the Jefferson Fork of the Missouri, the Madison and Wisdom Rivers. Some of the more aged mountain Indians well remember them, as being the first white men that ever visited their country, and point out with certainty the places of their encampment, show medals and presents given them. The names of Lewis and Clark and other officers of the expedition are borne by many a Flat Head warrior, a Blackfoot brave, or a chieftain Crow.

Sioux City is a village of fifteen hundred inhabitants, on the east bank of the river in Iowa. This place was commenced in 1853. The establishment of a U. S. Land office here gave it a start, and being made the terminus of the Dubuque and Pacific Railroad, it has become a place of importance, enjoying a good trade from a rich and agricultural country around it, and it is destined to be a point of interest. Three miles above here the Big Sioux River enters on the right, the separating line between Iowa and the Territory of Dakota, into which we now enter. Here we leave civilization, with but few exceptions, and enter on our journey almost anew, dependent on our own resources, cutting our own wood and hunting our own channel.

Passing the mouth of Vermillion River coming in on the east, we find at the mouth of it a small settlement just begun.

On the 21st we arrived at the town of Yancton, the capital of Dakota Territory, prettily situated on high rolling prairie, with some three hundred inhabitants, and surrounded by a rich agricultural country. The river bottom here begins to contract, and bluffs, from one to three hundred feet rise on both sides, with many green and beautiful slopes. In places indications of coal appear. Lignite crops out, with shale and slate, and the cretaceous formations appear which are to be seen on both sides of the river. But few Indians are to be seen, as we pass along through their country. The river is becoming quite free from snags, and the change from the monotony of the river below, to the more shapely and less snaggy stream here, gives us much

pleasure. We see a few settlers' cabins dotting the shores, but they are very scarce. The river banks and islands are well timbered; but all with the never failing cotton-wood. A few stunted cedars grow on the rocky bluffs; but no oak, hickory, or other hard wood is to be found on the shores of the river as yet.

We are now in the country of the Yancton Sioux Indians, a few of whom we saw last evening while taking in wood. These are the best dressed Indians, the most intelligent, athletic and cleanly that we have yet seen, except at the Omaha Mission. It is a disheartening truth, and humiliating, too, that so soon as we find the Indian on his own soil, away from the haunts and vices of the white man, we see more of that nobleness of character, of that original dignity, cleanliness of person, and moral tone attributed to him by the true historian.

We passed the site for a town to be called Niobrarah this morning, May 23d, some three miles below the mouth of the river by that name. Three or four houses had been erected, and the speculation seems to have died out. Some soldiers were encamped there, probably on a march. The Niobrarah River, or Running Water, a stream of about eight rods in width, coming into the Missouri from the west, is one of the largest and most important in the Territory of Dakota. Rising at the base of the Rocky Mountains, near the Black Hills, it traverses a rich and level country, with good timber, and said to be well adapted to agricultural purposes. The Ponka Indians live on a Reserve about forty miles up this river. They were once a part of the Omahas.

The Agency of the Yancton Sioux is on the east side of the river, Mr. Conger, from Dubuque, Iowa, being their agent. There are about twenty-three hundred of this band, many of whom are encamped here. They are peaceable and well disposed towards the whites, and are said not to have been engaged in the Minnesota massacre as they were charged to have been. The agency is fortified, and has a few soldiers to keep the post.

We arrived at Fort Randall in the afternoon, and spent an hour or more. This is a fortified military post situated on the west side of the river, built in 1856 and 1857, and was in com-

mand of the lamented Gen. Lyon at one time. It is well located near the bank of the river, on a slightly elevated plateau of ground, with a grove of timber in front. It is now under the command of Col. Pollock, with five companies of Iowa soldiers. On our arrival, soldiers and Indians thronged the landing, eager for war news, newspapers or any thing to break the monotony of camp life. There are no settlements in the country, no amusements for the soldier, and he becomes like the savage, listless and lazy, stupefied with sleep and tobacco, longing for his release from service, and the sweets of home and friends.

The navigation of this river is far more difficult than we at first apprehended. It seems different from any other on the continent, or perhaps in the world. Its channel is everywhere, and nowhere, shifted and turned in every direction, or spread over the whole area.

How unlike the clear, smooth, placid waters of the Mississippi, with a known and unchanging channel. For hours and even days we are compelled to spar and work the vessel over bars formed in a night, and ride in constant fear of snags and sand bars.

The color of the water is like a cup of chocolate or coffee, with sugar and cream in it. Its density and opacity may be readily imagined, when the fact is stated that a piece of silver placed in a glass of its water can not be seen through an inch of the liquid; and this not at a time of rise or freshet, but when it is in ordinary condition. Yet it is considered good and healthy. It settles readily by throwing in a handful of meal, flour or alum. Filterers are generally used on all the steamers that navigate this river, and when the water is once settled it is clear, sweet and palatable.

We have been passing to-day, the 24th, a range of bluffs about one hundred feet high, whose base is washed by the river, and are in general almost perpendicular, showing the strata of their composition very plainly. The boat landed at several of them, giving us ample time for examination. They are of the cretaceous formation but exhibit strata of gypsum, running for miles, and in some places cropping out in large quantities. It is found in broad foliated plates, and in the alabaster

form of compact masses. None of the colored varieties, as yet, have been found, but some very pure white specimens. The vein exposed here is very thin, not sufficient for the manufacture of ornamental articles, but of a purity equal to much of the alabaster used at the present day.

Indications of coal are good. Lignite, slate and shale have been plenty for a hundred miles back. Mica is found in abundance along the bluffs above and below the mouth of White River, which we pass to-day. The weather has become settled. and is quite warm in the middle of the day, but with cool nights and mornings. But little game appears on the banks of the river yet, and but few Indians are seen. A few cat-fish are taken at night, the only fish that inhabit this river. We are now in the latitude of 44 degrees 20 minutes.

We have been for the last four days, or since the 24th, laying up waiting for the river to rise, being unable to get over sand bars; but this evening we arrived at Fort Thompson, formerly called Usher's Landing. This little military post was built on the east side of the river in 1863, on lands set apart by the Indian Bureau for the future residence of the Sioux Indians of Minnesota, the Santee or Annuity band, that were engaged in the massacre of the whites in that Territory in August, 1862. The Commissioner of Indian Affairs sent an agent here to select lands, with instructions to locate them within one hundred miles of Fort Randall, which was done on a beautiful rich bottom, just above the mouth of Crow Creek.

The fort is a stockade, enclosing four hundred feet square, made of red cedar posts fifteen feet in height set in the ground, with bastions made of logs two stories high, and mounted with cannon. The post is kept by one company of soldiers, and the agency, the mission, sutler and trader, form the white population, while there are thirteen hundred and fifty Indians.

These Indians are a part of the Santee, or Annuity Sioux, who were taken prisoners by Gen. Sully, after the massacre. Three hundred and ten of their head warriors were condemned to be hung for this brutal outrage, thirty-eight of whom paid the penalty on the gallows at Mankato, Minnesota, in December, 1862. The balance of the condemned Indians were sent to Camp McClellan, Davenport, Iowa, in May, 1863, where they

still are, having their punishment commuted from death to imprisonment for life, by President Lincoln. The remnants of the band taken were composed of their old men, friendly Indians, the women and children of the tribe.

The Winnebagoes, who were settled at the time of the massacre, on Blue Earth River, Minnesota, near these Sioux, were supposed to sympathize with them, and removed here at the same time, but becoming dissatisfied with their location, a part of them descended the river last fall and settled on the Omaha Reserve, below Sioux City, with consent of that tribe; the balance of these Indians we met a few days since on their way down, in twelve canoes, with men, women and children, dogs, bales and bundles, piled up until it seemed impossible that their frail barks could navigate such a stream, with such a load. They landed, while our steamer passed, for fear of accident.

The mission and school of this band of the Sioux is the same that was established among them in Minnesota, by Dr. Williamson, and is now under the care and superintendency here of his son, the Rev. J. P. Williamson. There are about seventy-five scholars, and the mission is doing well.

The river has changed much lately, there being a rise, and sand bars and snags having disappeared, we plough our way against a stiff current at the rate of six miles per hour. The country seems to have changed altogether since we left Fort Randall. We are passing now some beautiful sloping bluffs, and the river is inclined to keep within its banks.

Death has followed and overtaken us here in the wilderness. Mr. A. P. Orr, a passenger, died last night, June 1st, of consumption. He was a native of Missouri, and for many years a resident of St. Louis. His disease was hereditary, and for ten years he had suffered, and seen many of his relatives laid away in the grave by the same disease. Although he cherished no hopes of recovery, he thought a removal to the mountains with his family of four children might be of benefit to them, and he undertook the task, with but little hope of living to get there. His wife has brothers living on Hell Gate River, and will meet the bereaved family at Fort Benton. We buried him this morning on a beautiful headland, formed by a junction of the Big Chienne River with the Missouri. It was a solemn occa-

sion for the passengers of the Roanoke, and truly afflicting to her, who had for many years watched with care and tenderness the declining health of her beloved husband. His mental faculties were bright and clear, even until death, reflecting through all his sufferings the beauties of the Christian religion, which he had long professed. The boat landed, a grave was dug on a beautiful rounded bluff, and we laid him in his last resting place, trusting that in the bright morning of the resurrection he will not be forgotten, although his grave is in the wilderness, far away from civilization.

We passed old Fort Pierre yesterday, one of the first trading posts built by the American Fur Company on the Upper Missouri. It is located in the centre of the great Sioux Nation, and once did an immense business in the fur trade with the different bands of these Indians. It is upon the west bank of the river, fifteen hundred miles above St. Louis, and considered the half-way post to the mountains. It has recently been abandoned. Its location is beautiful, on a plain surrounded by an amphitheatre of hills, with green sloping bluffs, and has been the theatre of some very exciting events.

Here gathered the Indians from all the various bands of the powerful tribe of the Sioux, that extends from the Mississippi on the east to the base of the Rocky Mountains on the west, to sell their peltries and furs.

The strength and power of this tribe are not generally known. There are upwards of forty bands, each having a chief, yet all acknowledging one superior, to whom all are subject. There are two grand divisions of this nation of Indians, called the Mississippi and the Missouri Sioux. The former have dominion over the waters of the Mississippi, the latter over the Missouri to the base of the Rocky Mountains. There is not, probably, a finer tribe of Indians on the continent in athletic proportions, dress, and moral principles, when found in their native wilds. They abound in horses, and are great hunters. It is almost incredible, the amount of skins and furs produced by them in one year. Take for instance the year 1848, when buffalo and other game were plenty. There were received at the warehouses in St. Louis, shipped by the Fur Company, one hundred and ten thousand buffalo robes, and twenty thousand

elk, deer, antelope, bear, beaver, mink, otter, martin, and fox, and twenty-five thousand buffalo tongues.

The buffalo have been thinned in numbers by the constant drain upon them, and still more by their onward march towards the setting sun, the vanguard of that dwindling army, the Red Man, whose destiny is to follow their trail, and whose sure fate is that of the buffalo, for both flee alike before the march of civilization. For nearly thirty years spent in the West, we have come more or less in contact with the various tribes of Indians who inhabit the vast plains lying about and between the head waters of the Mississippi and Missouri, and their life, history, and destiny have been subjects of deep and painful study. A once powerful nation spread over a vast territory, their history is beyond the reach of investigation, and lost in the darkness of barbarism, and now their national existence has almost expired; nearly their entire domain has been wrested from them by the hand of civilized man within the space of three hundred years; and ten millions of these sons of the forest now sleep in graves made by the firewater, the bayonet, the small-pox, and other evils communicated to them by the enlightened pale-faces.

Their misfortunes and calamities, from the shores of the Atlantic to the Pacific, are but one continued tale of woe, lamentation and death! The remnants of the race, with all their rich legendary lore, must pass forever into oblivion. The sufferings and death of this unhappy and ill-fated people must be lost. No true record can ever be known, and the last dying victims of the avarice and ambition of the white man will soon leave their foot-prints on the sands of the Pacific, an extinct and unknown race.

It is a sad and most humiliating thought that these were the men who met and welcomed the Pilgrim Fathers on the Rock of Old Plymouth, and in their destitution, fed them with "ears of green corn and with pemican." Is he a savage, and do my readers recount the many murders and bloody massacres committed on the white man? Does he call up the prejudices and deadly hatred of the Indian towards him? Who made him so, and why should he not be! His lodge was once a peaceful and happy home. No cares or anxiety crossed its threshold. He wandered in security through his native forest, and over the vast plain, and

knew, nor felt the withering touch of the white man. He worshipped at the shrine of nature's God, and trusted in earnest, simple faith to the teachings of the Manitou of the Red Man. He bowed with meek submission to the dealings of the Great Spirit with him. When afflicted, he blackened his face, and without food "went mourning many days." His home was an Eden uncontaminated and untouched by the rude hand of the white man; and he lived, and loved, the being that God made him in his own, his sweet forest home.

But the paradise of the Indian is broken up. The vile and the unprincipled, the avaricious and the strong entered his abode with the emblem of peace in one hand, and in the other the poison that has tainted all his race.

The Red Man fell. His native pride and dignity forsook him. His country was torn from him. His wives and his daughters were debased before his face. His senses, his manhood, his soul became deadened to all that was great, noble and good in his nature, and when at times he awoke from the transition, it was under a burning sense of injury, shame and injustice; and he became the cruel, revengeful, murderous creature that he is. His children inherit it, and his children's children will be taught the story of their wrongs, and that same hatred engendered by the race will continue until they no longer exist.

Does any one accuse the Indian of stoicism or indifference, or that he is incapable of affection, and the finer feelings of our nature? We have seen the most tender and affectionate caresses bestowed by the lover on the person of his loved one. We have seen the devoted wife weep with bitter anguish over the sick and dying husband; and the fond mother prepare the dead body of her offspring for its aerial tomb with all the genuine grief and sorrow so often exhibited in civilized life. When she had wrapped the babe in its blanket, and enclosed it in its little bark coffin, she would bend low the limbs of the willow tree, fasten the precious charge to the swinging bough, and then sit down and lament in silence and alone the loss of her darling child. And day by day she would carry fresh morsels of food, with the fairest flowers of her native prairie, and lay them on the breast of her departed offspring.

Nor is this grief too soon assuaged. Long months and years

will pass, and in the annual wanderings of the tribe, the fond mother will find the last sad relics of her little one, and weep afresh over its early grave.

Do you ask, is the Indian a man, and does he comprehend his being and his God? History points to many who have become renowned as warriors and chieftains, and many that have been good men, with intellects clear and bright.

Since the days of Samoset at old Plymouth, the system of removing the Indians farther back has been going on steadily, but surely, until the increase of population of the whites has hastened their exit, and the great drama will soon be closed. The base of the Rocky Mountains will no longer be the abode of the savage. The Anglo-Saxon will soon possess it, and on the giddy heights of that great barrier between the two oceans, the last relics of a once powerful people will appear like the withered oaks of their native forest, and view their destiny in the waves of the Pacific Ocean.

Our Government promises largely through their Agents in treaties made with this people; but those promises are not fulfilled, and well may the Indian call us "forked tongues," and say that "we march in winding tracks" to obtain our object.

"Like serpents," said the great chief Blackhawk, in his famous speech, "they have glided in among us; they have taken possession of our hearth-stones; the deer and the oppossum have disappeared at their approach; we are overwhelmed with misery. The very contact with the whites has poisoned us."

We have now spent the first week in June, and have been passing through a prairie country for several days, entirely destitute of timber except a very limited growth of cottonwood, with some ash, on the banks of the river, leaving our chance very poor for wood to supply the boat. From our steamer, the soil looks good, having a short growth of vegetation, but on examination is found to be a kind of hard baked marl, without moisture, and on inquiry of some Indian traders on board, who have lived long in this country, we learn that it seldom rains here from April to November. The grass is now becoming dry and dead. This is said to be the character of the whole of this part of the Dakota Territory.

We have passed the mouths of the Moreau and Grand Rivers,

and the Cannon Ball, and are at Fort Rice, from whence we send you our sketches by the steamer Silver Lake, which bears us company to the Fort, loaded with Government stores; she returns immediately to St. Louis. We are now eighteen hundred and forty six miles above St. Louis.

Thus far we have seen but little game. The buffalo have gone back to the hills, and will remain there until the little streams dry up, when they will return to the Missouri. A few only have been seen, and no Indians, as they are upon the trail of the buffalo. But few birds inhabit this region, of any kind. Large bands of antelope are constantly seen, but bound away at our approach. The only song of the feathered tribe that has greeted our ears in this far-off land has been the plaintive notes of the whip-poor-will, whose homelike song is ever loved, in every land. Its familiar voice awakens a thousand pleasing memories. It comes near to us as it did in the days of our childhood, at the old ancestral cottage in New England, as if to remind us of the sweet days of our youth, of associations long since departed, and memories saddened by the rude hand of time.

So far are we now from the Mississippi, and yet thirteen hundred and twenty nine miles from Fort Benton, our destination, and the head of navigation on the Missouri. When we have gone farther and seen more, we may have more to say.

ARTICLE III.

RELIGION AND CHEMISTRY.

BY PROF. J. B. SEWALL, BOWDOIN COLLEGE, BRUNSWICK, ME.

Religion and Chemistry; or, Proofs of God's Plan in the Atmosphere and its Elements. Ten Lectures delivered at the Brooklyn Institute, Brooklyn, N. Y., on the Graham Foundation. By JOSIAH P. COOKE, Jr., Erving Professor of Chemistry and Mineralogy in Harvard University. New York: Charles Scribner. 1864.

THIS course of lectures, first delivered before the Brooklyn Institute in January and February, 1861, was repeated the same winter before the Lowell Institute, Boston, nad the Me-

chanics' Association, Lowell. The volume is printed sumptuously on tinted and laid paper at the University Press, Cambridge, and is a luxury in the way of mechanical execution. We rejoice in the new era in book making which has dawned upon us in these later days. Our eyes rejoice. No more painful pages, we would gladly believe, of fine type and blurred printing. A lasting farewell to the volumes in which, for economy's sake, the long treatises of the fathers in Science, Philosophy and Theology, the latter especially, have been packed in fine print upon thin paper. Poor economy it was. As for ourselves, we long ago swore our Quaker oath that we would have nothing more to do with them, and have kept it.

The object of these lectures is indicated by the fact that they were delivered to the Brooklyn Institute on the Graham foundation, as well as in the title, "Or Proofs of God's Plan in the Atmosphere and its Elements." It is also thus stated in the first lecture; "It will be my object, in the present course of lectures, to aid in carrying out the noble purposes of the founder by developing before you the illustrations of the wisdom, goodness and power of God, which have been discovered in the constitution of matter." This work the author has accomplished in a most interesting and highly satisfactory manner, making a volume which is a very valuable contribution to natural theology.

The first Lecture consists of a "statement of the case," by way of introduction, and "Testimony of the Atmosphere in part." In the statement of the case, Professor Cooke sets forth the truth, that though physical science has in time past, through the elation of success while yet in the period of its youth, been somewhat proud and arrogant, and usurped the authority which was not its due, it must yet be and prove itself in harmony with faith and a handmaid of religion, and that the church certainly can have no reason for alarm from its investigations and accomplishments. And we may add that no good man ought to feel alarm at any of the pretensions of science. For, as we have always seen that that which was not properly founded in truth has come to the ground in time past, so we may be sure it will be in time to come. No falsehood can live. No edifice of untruth, however sustained in appearance by

science, can long stand. It is only truth which abides the test of time. Meanwhile, "fret not thyself because of evil doers."

He also lays down the principle correctly and with discrimination, that while natural theology is no substitute for a faith based on a supernatural revelation, it is yet the logical basis of such a faith. It is the necessary basis of Christianity. The Christian revelation does not prove the existence of God. It assumes it. "In the beginning *God* created the heavens and the earth." That revelation is based on a belief in God's being which already exists in the mind of man.*

While, however, the Bible never undertakes the proof of the being of God, it points to the sources of that proof; and in so doing evidently would have men study the testimonies, and bring them forth from the storehouses of nature and the universe. "The heavens declare the glory of God, and the firmament showeth his handiwork." If the heavens declare the glory of God, then their testimony is to be considered. Men are to look through science for that proof of the being and attributes of God which revelation assumes. For the best of reasons, then, the church should entertain no fear nor jealousy of science. At the hands of finite men, and men sometimes of unsanctified and irreverent minds, it is no wonder that it has given forth an uncertain sound. But ultimately it must sound with strong tone harmonious with revelation.

In the Testimony of the Atmosphere, commenced in the first and continued through the second lecture, Professor Cooke begins the presentation of the argument of special adaptations, which he continues by illustrations from the facts, and later discoveries especially, of Chemistry, through seven lectures.

The argument from special adaptations is that which lies at the basis of all works on natural theology, and is the same with that condensed by Dugald Stewart into the two propositions, that "Everything which begins to exist must have a cause," and "a combination of means conspiring to a particular end, implies intelligence"; including the truth put into these

*We should prefer to say not based upon a belief already existing; but, addressed to mind prepared by constitution to accept and maintain the idea as a truth when suggested. The Bible can go upon this truth unproved; because the human mind is so constituted by its author that it can not but accept the idea of God as a truth.

propositions by Reid: "Design may be traced from its effects;" and, "there are evidences of design in the universe." What is the force of this argument? This: Suppose on some morning walk you find yourself upon the wharf. A ship is freighting with an assorted cargo for some distant port, and on the wharf are many varieties of manufacture, and articles for different use and convenience. There are different articles manufactured of iron. Side by side are heavy anchors with their monstrous flukes designed to hold ships safely at rest in storm and in calm; and carpenters' tools, fitted with keen edge to hew and plane, make smooth surfaces and nice joints; and cooking stoves, with their various culinary utensils; and sewing machines, with their simple yet wonderful contrivances of needle, cogwheel and shuttle. Here is this common and homely, but most useful of all metals, in these various forms adapted to different purposes. What do you say of these different adaptations? That it required not only mechanical power and skill to make them; but intelligent mind, and more or less of benevolent or selfish motive to contrive and shape them for their different ends. The shaping of the anchor to take hold with its strong flukes at the bottom of the sea, and the ponderous machinery which molded and forged it, required intelligent mind. There was an end foreseen, a result to accomplish. So with the carpenters' tools, the stove and its utensils, and the sewing machine. The material is one; but in its different shapes it is adapted to different uses. Mind could only foresee those uses, and govern in shaping the metal differently in view of them. So if one were to enter a machine shop, and see on the one hand iron wrought into the form of a locomotive, and on the other into the form of a stationary engine. It is mind only, intelligence, will, and more or less of benevolent or selfish purpose, which determines the different forms which the metal takes, and that according to a final cause.

So with the atmosphere or water or metals, anything which exists in nature with a use and for an end. We *know* in the previous cases that mind has presided as the originating and producing power for the sake of the end; we are convinced that it must be so in the latter. It is an argument of analogy, but the very strongest of arguments for all that. Considering

a tree with its fruits, or the soil with its different qualities, or any gas with its peculiar characteristics and end which it fulfils, a man would no more be able to admit that either existed by chance and without any originating intelligence and will, than that the locomotive, thundering by on the railway with its ponderous train of cars, or the sewing machine, put in motion by the sewing woman's foot, and doing the work of many fingers at once, was a growth and an existence of mere accident, independent of any power of reason and will. It is as strong an argument as is possible. It is different in kind, indeed, from the so-called demonstrative of mathematics; different, from the nature of the case; but we affirm that it is equally valid and valuable. Professor Cooke at the commencement of his eighth lecture, remarks:

"We have read together one brief chapter of that evidence of design with which the book of nature is filled, and I can not but trust that we have gained from our study nobler conceptions and more enlarged views of the wisdom, power, and goodness of our Heavenly Father. Every one who accepts the Bible as a divine revelation will rejoice to find how beautifully and how entirely the facts of science confirm its great fundamental truths. But have not these evidences of nature a greater value even than this? Do they not prove, independently of all revelation, the existence of a wise and omnipotent first cause, at least so far as there is any moral certainty in the world? I am persuaded that they do, and I believe that they furnish the only logical ground on which a system of revealed religion can be based."

We agree with him. We believe that they do prove the existence of a wise and omnipotent First Cause. There are different kinds and degrees of argument; but what is proved by one is as much proved as that which is proved by another. It is as great misfortune that demonstrative reasoning, which belongs strictly to the domain of pure mathematics, should be exalted into a place of preference and respect as a kind of reasoning — as being of a better and more certain sort than any other — as it is foolish for any one to ask for its methods where only other methods can be employed, and to refuse conviction and belief because its methods can not be employed. A man has just as good ground for belief in his senses when he feels

pain, and in the general testimony of the newspaper press as to the current news, as if he could sit down and demonstrate a headache or twinge in the pleura by a process in geometry; or the fall of Richmond by the integration of a formula in calculus.

Let us now glance briefly at some of Professor Cooke's elaborate and beautiful "Testimonies."

First, in the atmosphere. The atmosphere is a vast ocean of matter enveloping the globe, extending to an indefinite height above our heads, a height of many miles, so fluid and subtile that it accommodates itself to all inequalities, pervades all porous substances, and presents, ordinarily, but an imperceptible resistance to the motion of bodies. All objects are immersed in this ocean of air, and all the vital processes of the animal and vegetable kingdom are carried on in it. It is real matter, as real as the timbers of our dwellings, and the rocky walls of their foundations; yet so fluid and yielding that the crystal snow flowers descend through it, and gently rest upon the ground unbroken; the spider hangs out the gossamer lines of his web in its currents with security, and we move through it without feeling its presence. It is firm enough to sustain the wings of the lark and the eagle in their flight, and drive the deepest laden ship through the waters on its voyage, and yet the tiniest insect is not detained in its flight. To keep it from dashing off into space from the centrifugal motion of the earth, or through rarefaction by the sun's heat, it is bound down to the surface with a force of gravitation equal to a pressure of fifteen pounds upon every square inch. A greater pressure rests upon the area upon which any ordinary building of wood, brick, or stone stands, from the atmosphere, than from the building itself. This is to keep it in place, yet it does not prevent the minutest seed from thrusting its shoot out of the soil, nor make a medium too dense for the blossoming of the most fragile flower. It bears necessarily upon every man of ordinary size with a weight of sixteen tons; yet with such balance and compensation that he is never aware of it, and can sustain the burden as well when worn out with the weakness and languor of disease as when in the vigor of health. How great the force is which is required to restrain the expansive, and

counteract the centrifugal tendency of the atmosphere, few persons have an adequate conception, because of the nicely adjusted balancing of these forces. We are obliged to call in the aid of experiment to render their effects evident. The world never dreamed of their existence until within two hundred years, the time of the discovery that " nature did not abhor a vacuum above ten meters," as Galileo said to the Florentine pump makers, and that water could not be made to rise by pump-suction, so-called, more than thirty two or three feet.

" The attempt to grasp it " — the conception of the mighty force exerted in holding the atmosphere in its place all the world round — " only exposes our weakness, and yet this force, immense as it is, is so delicately balanced by the sweet influences of the sunbeam, that it does not so much as shake the aspen leaf or break the gossamer. If we believe no more than this, that the world was once created by God, what must be the power and wisdom of a Being who could appoint these mighty forces and adjust them with such perfect precision! But if we also believe that these forces are direct emanations of Divine Power, that it is God himself who with his own right hand holds the atmosphere in its place, and appoints its bounds, then all nature assumes a more glorious aspect, and we feel that we are indeed surrounded by the Divine Presence." p. 26.

The air is the immediate means and instrument of organic life. Given the organic constitution of the human body — this mechanism and system of combined materials and organs, to have life, to be possessed as a habitation by a spirit, to grow, be sustained, and then decay, and the blood as the life-bearing current to be purified and renewed each moment by some subtle agent from without, and the lungs as the instrument, a vessel of network so fine that the molecules of blood can not escape and yet the particles of a more subtle fluid can enter; what more perfectly adapted as the vehicle of the blood's renovation and purifying than the air? The blood's renovator and purifier is oxygen, an element so strong in its affinity for other substances, for the very substances of which the human body is constituted, and so fierce and vigorous in its combination, as to consume wood and even metals with the bright flame and white heat of intense combustion, and yet it never attacks the throat through which it constantly passes, nor assails the delicate network of the lungs with scorching corrosion. For, in the air, it

is held diluted in the embrace of the neutral torpid nitrogen. Every time we breathe, the lungs are distended, the air flows in, compelled by pressure to fill every crevice and vacant place, gives up its oxygen to the blood, and receives in return a load of carbonic acid, which by respiration it carries forth. What more beautiful and surprising arrangement could there be than this, and what more demonstrative of a wonderful intelligence and skill in the adaptation?

While the air is the medium of this vital process in the lungs, or what serves for lungs in every animal organization, insects in the air, worms in the ground, and fish and polypes in the sea as well as man, bird, and beast on land, it is the medium of a reverse vital process with the plant. The plant needs carbon for its purposes of life. Almost all its substance is carbon. The leaves are its lungs, and kept at work by the force of the sunbeam they are constantly drinking in the carbonic acid breathed out of the myriad lungs of the animal world, and discharged from all the chimnies of human dwellings, and pouring out in immense quantities from every manufacturer's forge and furnace, and the lime burner's kiln. The air is the vehicle of the carbonic acid to every leaf of tree and blade of grass, and it receives again the oxygen, which, the plants retaining only the carbon of the carbonic acid, is remitted for animal use again. And thus through the atmosphere, as the shuttle of the great loom, carbonic acid and oxygen are playing to and fro between the two great kingdoms of life, animal and vegetable. What an arrangement for compensation and preserving the balance of things. Is it the work of blind insensate forces, or of infinite wisdom and skill residing in a personal willing intelligence?

The atmosphere holds a beautiful relation to light. It is owing to the atmosphere, in the first place, that light is equally diffused, that it finds its way into places, even deep caverns in the earth, which are not directly accessible to the sun's rays, and that it is retained and we are not left suddenly in darkness when the sun sets, and that the morning sunrise is not a sudden burst from the darkness of midnight into the brightness of noonday. The atmosphere has the power of refracting light, that is, of turning it out of its course, as has water, glass, and every other transparent medium. By this means some of the sun's rays

reach us over the horizon before the sun himself rises above it; and some of his rays linger behind when he has sunk below the horizon in the west. But this is not all. This does not account for the diffusion of light where his rays can not directly come. We call the air transparent. It is not wholly so. If it were, every ray from distant objects would come to us, and the remote features of a landscape would not be indistinct. Each particle of the mechanical mixture of oxygen and nitrogen of which the atmosphere consists, is a reflector. Air is material, it is to be recollected, as much as iron or stone, and though its particles are so wonderfully arranged that they permit the passage of the rays of light, to use the language of the old theory, or to say better in the language of the new, they transmit the mode of motion which constitutes light, yet each particle reflects a minute portion of the light, or communicates the mode of motion anew, in new directions; and thus literally the air is filled with light, and literally holds and retains it after the sun is out of sight. For this reason our dwellings are not dark, except where the sun streams directly in, or the walls reflect, and when we look around it is not everywhere dark except as objects catch and reflect the rays. This is confirmed by the fact that air as it is rarified becomes less capable of retaining light. "On the top of Mont Blanc," where the air is much rarer than at the sea level, "the sky has a blackish hue, and the stars are seen at mid-day. The glare of the direct light is unsupportable to the eye, and even the reflection from the snow blisters the unprotected skin, while at the same time the contrast between light and shade, unnaturally increased, gives to all near objects a peculiar and ghastly aspect." p. 38. By reason of this wonderful constitution of the air, thus again nicely and most beneficently adjusted to the wants of man, the light can not be anywhere confined, or from any place shut out. Where air can pass, light will pass with it, and not even bars or bolts can wholly exclude it from the prisoner's dungeon.

Professor Cooke seems to be at a loss to account for the varied tints of the sunset sky. He says, "it is probable that the sunset tints arise from the changes in the white light of the sun caused by an unequal absorption of its different colored rays during their transmission through the atmosphere. Here,

again, the vapor in the air is supposed to be the active agent, and the theory is, that the tints are produced while the vapor is condensing into clouds, a change which naturally occurs at sunset. But this is a mere theory, and our whole knowledge on these subjects is very imperfect." p. 39. We venture to suggest that the experiment with the glass prism which gives us the solar spectrum, affords us the true explanation. The atmosphere refracts the sun's light. It moreover varies in density; is most dense at the surface of the earth, and grows less dense as its attitude increases, till at the height of forty or fifty miles it is so rare that its effects in astronomical observations are inappreciable. Now, in respect to our zenith, the sun's light after it is set enters the atmosphere obliquely, and the body of air inclosed between planes extending from our eye to the horizon and the limit of the atmosphere beyond, and to the zenith, is exactly a prism made of air, and filled with the solar spectrum on a large scale, every color being there of a clear evening, from the red at the bottom or horizon, which is the ray of light least refracted, to the blue in the zenith, which is most refracted by the power of the prism. Any clear evening, where one has a distant horizon, as from a hill or across low, level lands, one can test this for himself. The air of the western sky seems filled with the various colored light of a vast solar spectrum, simply because the air through which come the rays of the setting sun, acts as a prism. And when a cloud sails athwart the scene catching the rays again, again they are refracted, and the red and gold and purple are bent down to our vision. The cloud exerts again and in its degree a prismatic power.* But however it may be, in all this there is to be observed a remarkable adjustment and adaptation of this element to the moral and æsthetic constitution of man. And in the same line is to be noted the beauty which is conferred upon the landscape from the color of the atmosphere. Not being perfectly transparent the atmosphere has color. It is a delicate blue. Look up into the sky. What a glorious dome of ultramarine is chiselled by the sweeping limit of the vision, as if a

* We do not forget the fact, so frequently remarked in its wonderful exhibitions among the Alps by Professor Tyndal, that vapor plays a great part in the coloration of light in the atmosphere, and therefore that what is said above of the clouds can be but a part of the truth.

solid concave of pure lapis lazuli! Now look away over the broad landscape. See how the distinctness of the foreground diminishes as the line of vision recedes. The hills and fields and woods of the middle ground are hung with a gossamer veil of silvery gray; and the mountains behind are but tinted with blue; while those on the horizon are a decided blue. What is the atmosphere? It is what the artists call aerial perspective; and any picture wanting it, is bold, staring and harsh. How every feature here is softened. It is an adaptation to our sense of the beautiful. Was it one and the same hand which formed the eye and fashioned the faculty by which we have a sense of the beautiful, and which formed the atmosphere, or was it not?

The Testimonies of Oxygen. The composition of the atmosphere is as follows:

Oxygen	20.61
Nitrogen	77.95
Carbonic Acid	.04
Aqueous Vapor (average)	1.40
Nitric Acid	traces
Ammonia	"
Carburetted Hydrogen	"
	100.00

This is the result of analysis made by chemists hundreds of times, and in every variety of climate and region. These elements, however, it is to be remembered, are not chemically combined in the atmosphere. They are only mixed. The vapor is one thing, and may be subtracted from the air; and the oxygen another, and may likewise be subtracted. In fact, oxygen is the vital element; only, being too strong in its purity, it is diluted with nitrogen. The only office of nitrogen in the atmosphere seems to be that of a diluent.

The most remarkable property of oxygen perhaps, in view of its uses in respiration, is that it can not be reduced to a liquid or solid state by any amount of pressure, or degree of natural or artificial cold to which it can be, or at least has as yet been, subjected. Almost all the other aeriform substances can be reduced to either a liquid or a solid form by pressure or cold. But oxygen has been subjected to the combined action of intense cold and a pressure of over forty five thousand pounds on a square inch without producing a change in its condition. This

is the more remarkable, and is seen to be expressly an adaptation to the requirements of an atmosphere for breathing, when we consider how readily oxygen enters into chemical combination, and this constitutes the greater portion of the earth's solid crust. Mr. Cooke calls it the "world-builder." The solid rocks consist chiefly of oxygen, reduced to that solid state by the force of what we call, in our ignorance, its chemical affinity. All the water of the globe is oxygen in combination with hydrogen. It easily forms a solid or a liquid, yet in its pure state, or as diluted with nitrogen for the purposes of vitality, it can by no means yet invented be reduced to either condition. Suppose that like aqueous vapor, which is one of the constant elements of the atmosphere, it could be condensed to a liquid by a fall of the temperature a few degrees, or rendered a solid like ice? Think of the wide variations of temperature which exist on the globe, but neither oxygen nor nitrogen suffer any change of condition. They persistently retain their aeriform condition in them all. Prof. Cooke gives a fine illustration of force in nature in this connection:

"Remembering that twenty tons pressure on a square inch are not sufficient to reduce oxygen to a liquid condition, consider what must be the strength of that force which holds it thus imprisoned [in water, the organic substances of our bodies and of plants, and in rocks]. In this tumbler of water there are no less than six cubic feet of oxygen gas, condensed to a liquid condition, and held there by the continuous action of a force which can be measured only by hundreds of tons pressure. We call the force chemical affinity; but who shall measure its power? Who but He who could make with such a subtle material the rocks, with which He 'laid the foundations of the earth,' and the waters which roll over its surface?"

Oxygen is heavier than nitrogen, one cubic foot weighing about seventy grains, (73.3) more than a cubic foot of nitrogen. Since, then, the atmosphere is merely a mechanical mixture, why do not the gases obey the law of gravitation, and the denser settle at the bottom? Because as gases they are endowed with the property of diffusing through each other, as other forms of matter have not. Suppose this property of diffusion non-existent, or the force by which it is secured less. Then would not only the atmosphere be unfitted for the pur-

poses of organic life by separation of its gases, but for many other important functions, for instance, of transmitting sound. Sound is by vibrations of the atmosphere. Its uniformity and constancy are secured, as must be at once seen, by the uniformity of the vibrations. But this uniformity could not exist in a medium of varying density. The constancy of pitch could no longer be relied upon. Passing through an unvarying medium, the sound would arrive at the ear with a very different tone from that with which it was formed. We should thus never have known the beauties of music, the sweet tones, melodies, and harmonies of voice and instrument in song. "Whenever, therefore, you may be next enjoying the grand Pastoral Symphony of Beethoven or the Requiem of Mozart, recall the careful adjustment of forces by which alone these magnificent creations of genius were rendered possible, and you can not fail to recognize in this simple law of nature the same hand which first strung the lyre and made the soul of man responsive to its seven notes."

Oxygen is without either odor or taste; very essential, these negative qualities, to our comfort and well being. Suppose it were like sulphurated hydrogen? It is ordinarily very inactive too, though so strong in its affinities and violent in its action when obeying its affinities. Combining with carbon in the form of wood or coal it acts with the greatest vigor, consuming the wood or coal in combustion, and throwing out great light and heat. In pure oxygen a steel spring burns, i. e., is attacked by the oxygen and oxidized, with intense light and heat. Edged by nitrogen in the form of nitric acid, it assails wood, metals, clothing and flesh with great fury. But in the atmosphere, merely diluted with nitrogen, or even when pure, it bathes innocently the frailest flower, and subserves only the purposes of life and strength to the finest animal tissue. It scorches no man's throat as it is poured to and fro in breathing, nor tickles his larynx to a cough, nor bites with its sharp tooth one of the meshes of the network of the lungs.

Heat is a mode of motion. Yet the coursing to and fro of the crimson flood in our veins is not sufficient at all times to keep us warm. Nor, superadded, that other process of slow combustion which by the union of oxygen and carbon in the blood

is constantly going on within us. We need fires. We need them also for the processes of all arts. And a kind hand has reared the forests, and stored the beds of coal. What is fire? What the blazing flames on the hearth, the glowing action in the grate, the furious burning in the furnace, and the gentle flame of the candle? All one—simply the chemical union of oxygen with the carbon and hydrogen of the different substances. For the great supply of heat required, these substances are made very abundant, oxygen is endowed with a strong affinity for them, and fitted to combine readily, and give out heat in the process. But oxygen laves all our dwellings, without and within, and every most delicate and beautiful ornament of wood or paper, or other combustible article we possess. Why are they not burned? What stands guard over every combustible material and says to the oxygen, thus far shalt thou come and no farther? Simply a few degrees of temperature. One substance must be raised to a red heat, another to a white, etc., before the vigorous oxidization called burning can commence. We may therefore build fires in our dwellings, in fire-places and grates and furnaces which are themselves combustible, and not burn them down. We may casually touch a burning coal even to the wood work of those dwellings and not set them on fire. And yet this process of combustion is so necessary on every hand, necessary for the purity of the atmosphere, the conduct of the unceasing processes of growth and change, and the preservation of the balance of conditions, that it must be going on at every temperature. So it is. This vigorous eater, this fearful devourer, consuming whole cities in a few hours, which would seem to need but a taste to whet its tiger appetite and set it upon its destructive work, is everywhere eating away noiselessly and almost imperceptibly. The rusting of every iron implement, the tarnishing of every metal ornament, the weather-stain of every board, the gradual wearing out of every coat of paint, and the slow decay of the prostrate monarch of the forest, is all one and the same thing, the same process with that which takes place in the parlor grate, combustion—oxygen slowly eating away what under slight differing conditions it would consume with such fury.

"To think that this, the strongest of the chemical elements, which, although a permanent gas, forms more than one half of the solid earth, and is endowed with such mighty affinities that it is retained securely in this solid state, could have been so shorn of its energies as not to singe the down of the gossamer, and yet so tempered that its powers may be evoked at the will of man and made subservient to his wants! To me the double condition of oxygen is one of the most remarkable phenomena of nature. I ponder over it again and again, with increasing wonder and admiration at the skill of the Infinite Designer, who has been able to unite in the same element perfect mildness and immeasurable power. It seems as if the millennium of the Hebrew prophet were prefigured in the atmosphere, 'The wolf also shall dwell with the lamb, and the leopard shall lie down with the kid, and the calf and the young lion and the fatling together, and a little child shall lead them.'"

The Testimonies of Water. Water exhibits adaptations in a more wonderful manner even than oxygen. This is the liquid of the globe — the only natural liquid, if we except certain transient products of volcanic action. "Moreover, it is in constant circulation, and, like the blood in our bodies, is the medium through which nourishment is conveyed to all parts of organized nature, and its life sustained." Professor Cooke in speaking of oxygen, says that the crust of the earth, so far as we can examine it, is like a burnt cinder, the atmosphere of oxygen surrounding it being merely the residuum left after the general conflagration—left because there was nothing more to burn. The water too, as well as the rocks, is a residuum of the conflagration. Water is always the result of combustion, a combustion where hydrogen is the element with which oxygen combines. And when Professor Cooke tells us that a tumbler of water represents six cubic feet of oxygen, and that one cubic foot of water represents more than eighteen hundred cubic feet of the two gases together, and then think what portion of the earth's surface is water, we can judge what immense quantities of these gases were in existence in that formless and void state which preceded, in geologic history, the period of condensation and evolution of light and heat.

This vast amount of water was to be. All vegetable and animal life was to be as much dependent upon its uses as upon air and oxygen. The ocean beds are therefore hollowed out,

or, rather, the dry land is so made to appear as to leave these immense water trenches. And there it is safely stored, out of man's way, and threatening him with no danger except he tempts it. How, now, shall it be conveyed upon the land? What is to prevent every land, warm or cold, from becoming parched and dry, and incapable of sustaining life? Where are the vehicles for its conveyance, or what the apparatus with which it is to be raised and diffused? Here it is, all wonderfully simple and beautiful. Simplicity is the highest attainment of invention and intelligence. Water is endowed with the property of vaporization; i. e., at all those degrees of temperature at which it exists in a liquid state, it assumes more or less a gaseous form. It mounts into the air in the form of vapor, and thus as an atmosphere is borne in currents wherever currents of atmosphere go. How does it descend? Not always as a vapor or mist again, which would continually shut out the direct rays of the sun. In the higher colder regions it is condensed into drops, and falls as rain; and how violent soever the shower or storm, yet how rarely is harmed the feeblest organism of the vegetable world. Suppose it condensed and fell in large bodies.

So the circulation of the world is maintained. Vapors rise from the ocean. In the swift currents of the atmosphere, and by diffusion, they are borne everywhere. In the cold upper regions clouds are formed, and from them fall, in summer, rain, in winter, snow. The atmosphere is ever moist. The ground is watered; the springs are filled; the brooks empty into the rivers, and the rivers pour themselves into the ocean, a ceaseless round. In the moistened atmosphere, vegetable life is kept fresh and plump, and preserved from the undue heat of the sun's rays. In some climes where, from the meteorological peculiarities, rains fall only at stated seasons, the moisture always pervading the atmosphere is deposited abundantly as dew, according to a simple arrangement by which, as the heat of the sun is withdrawn at night, and the warm soil tends to give up its heat to the overlying atmosphere, each spire of grass, pointed twig, and roughened surface become condensers and receivers of the moisture of the atmosphere. Why is the ice pitcher covered with drops of water in summer? Not because water exudes, for it can not; but because the surface of the pitcher,

having been made artificially colder than the surrounding air, condenses the moisture upon itself.

In the winter — how wonderful — when by reason of the sun's declination his heat is greatly withdrawn, and the ground would be frozen deeply and vegetation suffer, the rain becomes snow. In the cold of our winter skies, the watery atoms marshal themselves into delicate crystalline forms, and come down softly, covering the earth with a thick mantle of white wool, which both reflects the sun's rays and protects the soil beneath by preventing the heat of the earth from radiating. In northern New England heavy snows often fall in the autumn before the ground is nearly frozen, and remain till spring, when melting rapidly they restore the ground to the farmer ready almost at once for the plough.

In the fall of rain there is a mark of nice adjustment in the fact that the density of the atmosphere, being what it is, presents a resistance for the falling rain drops to overcome. Were it not so, every drop would strike the ground like a leaden shot, and vegetable life would be destroyed by the very means taken to preserve it. Also if the air were a much rarer medium than now, water would burst into vapor suddenly upon slight increase of temperature, and of course as suddenly fall with the opposite change.

We know that water is a most useful and imperatively necessary article in life. We can conceive what inconvenience would arise in a dwelling deprived of it for a single day. How difficult to prepare one meal. How impossible to quench one's thirst, even though there be at hand all liquids which are brewed and concocted for drink. We can even understand why the traveller in the desert, the last drop in his water-keg or leathern bottle long since exhausted, should be ready to offer hundreds or thousands of dollars, everything possessed, for one single cup of the refreshing, life-sustaining liquid. But we suspect few know to what a degree water enters as a constituent into their own bodily organizations, or into the organization of vegetables. The physical man has been described by one writer as consisting of merely a few pounds of solid matter distributed through six pailfuls of water, and it is a fact that no less than four-fifths of these bodies of ours are made up of

water. In some of the lower formations of animal life, the proportion of water is much greater. From a large sun fish found on our coast, weighing thirty pounds, Professor Agassiz obtained only two hundred and forty grains of solid matter.

Of water, plums contain 75 per cent., potatoes 75 per cent., apples 80 per cent., carrots 83 per cent., turnips 90 per cent., watermelons 94 per cent., cucumbers 97 per cent.

Glance now at the wonderfully various adaptations of this element. Begin with the sea, fitted to be the home of all the variety of marine fauna, the distributer of heat, equalizer of climates, and the highway of the world's commerce; having a highly intellectual value in this respect, stimulating man to labor and invention to overcome the barrier it presents, and make it a conquest to human mind and will.

Follow it in the cloud, exciting our delight by its gorgeous beauty in the morning or the evening sky, or when sailing in fleecy whiteness athwart the azure of a clear summer's afternoon, or subduing us to stillness and reverence, perhaps fear and awe, when bursting with violence in storm upon our dwelling; in the falling rain and snow, or gathered dew and frost; in the silent soil among the roots of giant trees, matted grass, and tiny flowers; to the fountains where man and beast may quench their thirst; in streams which drain the land, purify the country, turn machinery, add beauty to the landscape, and, before pouring again into the sea, are performing a part of the slow work of ages in bringing about geologic change. What a course! What varied forms; what manifold accomplishment; and with what ease, exactness, comfort and delight to sentient beings.

We will not follow Professor Cooke in the path he opens so well and beautifully any further. He continues through the testimonies of carbonic acid and nitrogen, and closes, in his ninth and tenth lectures, with a presentation of the argument from general plan, and a few words upon the necessary limitations of scientific and religious thought. We were led to expect more upon this latter topic, and pressed through the volume on first perusal to this point with lively expectation. Perhaps we were looking for more than we had any right, from the fact that this has already been a prominent topic in religious

philosophy. However that may be, these pages have proved unsatisfactory; but we must add, the only unsatisfactory part of the volume.

We briefly add the following:

1. We conceive that Professor Cooke in this volume erects a perfect argument against pantheism. Pantheism identifies nature or the universe, in its totality, with God. It makes all that exists objectively, merely a manifestation, form of development, mode of being in part, of a subjective, infinite force, or world-soul. All the separate parts and individualities are only special and local developments of the great ONE. The personality of God is destroyed, because there is no personal will, no individual intelligence, aside from man's. Man is the highest form of development and manifestation the world-soul makes. We understand the pantheist to say, the choragus of pantheism in this country has said, that he knows and that he recognizes no higher form of Deity than himself. In his philosophy, creation is but the varied development of this one great, central, and at the same time universal force, blind, unintelligent, unwilling force. It is ever struggling toward the highest form of development, and man is the highest yet attained. We can not say, "*Judæus credat.*" The Jew never could. The best we can say is, *Stultus credat.* None but those described by the apostle Paul, Rom. i. 28, ever can. We should find it at the outset, infinitely more difficult to accept the premises of pantheism, than the premises of the Christian religion, independent of revelation and natural theology. But as we say, we conceive that in this volume is presented a perfect argument against pantheism. We conceive it to prove, with a certainty equal to demonstration, a personal God. It leads the mind along paths where it must believe, if it may believe anything, that there are on every hand *proofs* of an intelligent, willing, designing force, acting with creative and controlling power. It brings the mind into the presence of law, wonderfully ramified, networked, sometimes in action in full force; but more often greatly modified and adapted with other law, which, as the human mind is constituted, necessitates, in our view, the belief in a personal will and intelligence residing in the origin-

ating and all-underlying force. Professor Cooke himself puts it well:

"What is the primary cause of motion? If we can explain the simplest case of motion, we have solved the problem for the universe. Take for example, a boy's ball moving through the air under the impulse of a well-directed blow. Do we not know something of the cause of that motion? Is it not connected with the muscular contraction of the boy's arm, produced by his will? Is not his volition, acting mysteriously on matter, at least the occasion of the motion? It is perfectly true that the will does not create the motion. The ball is impelled by a portion of that energy in nature which man can neither increase nor diminish. But still, the boy's will is the occasion of the motion. It has opened the channel through which the energy of nature has flowed to produce the specific result which the boy desired. So, in a thousand other ways, man is able to come down, as it were, upon nature, and to introduce a new condition into the chain of causation. Place the point of contact as far back as you please, theorize about the subject as you may, the fact still remains the same. Our will does act on matter, and does act to produce most efficient results. Here is energy exerted of whose cause we have the consciousness within ourselves, and, if the analogy is worth anything, it points to but one conclusion — namely, that motion is always the manifestation of will. . . . According to this view, the energy which sustains the universe is the will of God, and the law of conservation is only the manifestation of His immutable being — 'the same yesterday, and to-day, and forever.'"

2. It presents an equally perfect argument against materialism. Pantheism and materialism are different as philosophies, but identical as theologies. In materialism there is no other God than the laws and forces of nature. They rest back in no personal, intelligent, originating, and ever conserving will and power. The universe is self-existent, self-directed. Organization, sensation, intellection, arise from the modification of matter. Does the pursuit of science, do its investigations tend to materialism? So many in the church have feared and believed, but without reason. Properly all such study must lead where this volume shows it to lead, to the recognition of spiritual existence as the primal cause and conserving power of all material existence. The more the laws and properties of matter are ascertained, the more nearly is an approach made to spirit and will. And science will one day prove what inspiration has de-

clared: "The invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made, even His eternal power and God-head." And we believe for ourselves that the new discoveries which have led to the new doctrine of the correlation and conservation of forces constitute a long stride on the part of science in the direction of revelation.

3. It is manifest, then, what part natural theology sustains in the present attitude of the great conflict. It is to gather from new fields, the fields which it is the work of science to daily open, new proofs and testimonies in behalf of revealed religion. We repeat, revelation does not prove the existence of God or his attributes. It assumes them. It is left to natural theology to prove them, and as Professor Cooke remarks, natural theology furnishes the logical basis on which the whole scheme of revealed religion given us in the Bible rests.

4. There is imperative need that the clergy now and ever keep in the front rank in the progress of knowledge, scientific as well as all other. They can not always be personal investigators. It is not intended that every man should be, in any other department than his own. But the results of original investigation are always at his hand, as in this comely volume. And we have to thank the author that in it he has placed such means in the hands of the ministry, not only for the work of direct proof, but for that of illustrating revealed truth and throwing light upon it in a thousand ways. It is a volume affording material, fact, "the stuff argument is made of," as our venerated Professor in homiletics used to say. And we are mistaken if men in these times, in our own country at least, are not peculiarly ready to hear that preaching which consists of or is based upon plain, solid, convincing argument. And we submit that the pulpit has sustained the loss of power upon the minds of men, which it now exhibits, from the fact that the ministry, in sermon making, have too much left the paths of substantial reasoning and dealing with great facts and most weighty truths with their issues, for mere oratory and effect. Let the times of plain sound reasoning, and appeals made to the conscience and heart through common sense return, and let us see if there is not in our churches and communities at large a revival of the former power of religion.

ARTICLE IV.

MARSH'S MAN AND NATURE.

BY THE REV. I. P. HOLTON, BOSTON, MASS.

Man and Nature; or, Physical Geography as Modified by Human Action. By GEORGE P. MARSH. New York: Charles Scribner. 1864.

IT is for man to make a paradise or a purgatory of the globe on which he dwells. And this is not merely true within the narrow limits occupied by a single family and subject to the control of an individual proprietor. There is a slower, wider impression made on the face of a kingdom by the occupancy of a nation for successive ages. This impression is wont to be the seal of desolation, a desolation such as nothing but the hand of creative Omnipotence would seem capable of producing.

For illustration of this, go to the original home of the human race, the native home of the horse, the ox and the sheep; of wheat and barley and rice; of the apple, the pear, the plum, the fig, the melon, the vine and the olive, where the plantain, the greatest of all herbs, and the most fruitful of all God's gifts to man, once reared its tall, juicy column. What remains of that blissful land? Can these vast solitudes of naked rock and dry ravine be the cradle of the human race? Surely, this desert can never have blossomed as the rose, and teemed with a dense, busy and prosperous population! But look again: in this desolate waste rise lofty columns, and at their base lie masses of sculptured marble, mingled fragments of architrave and cornice and foundation and pediment. Stupendous ruins of nameless cities bear witness to an ancient fertility unexcelled by the most favored spot on earth. Here, in wealth and luxury and pride dwelt a people forgotten before the birth of history. Their memorial is perished with them, and their land is an astonishment for barrenness. What has wrought the change?

Man alone of all created beings is capable of achieving a desolation like this. No other, living or extinct, could make any abiding impression on the face of nature. Before his advent all nature was in equilibrium. The lichen corroded the

solid rock, and drew thence its food. It decayed, and its dust was the soil for the growth of other plants. On these fed animals, themselves the food for other animals. The proportionate numbers of rival species depended on the favoring or adverse influences of climate. As food became more abundant the eaters multiplied; with any diminution of supply dependant races decreased. True, the beaver converted the rivulet into a pond, and built there his city; but nature in time filled his pond with sediment, it became a flat marsh; its inhabitants built in a new location, and again trees waved where trees had waved centuries before. The coral-polypes are a seeming exception to this principle; but their operation is so slow and so vast as to deserve a place among geologic agencies tending to the development of the globe.

Thus all nature stands balanced in equipoise till man, her lord, is brought upon the scene. His maker and hers has given him dominion over her. For his occupancy uncounted ages have been preparing the earth, and he comes to subdue it. He finds it, with fewer exceptions than we are apt to suppose, covered with forest. Tall columns lift the vegetation far above the surface of the earth. Vines ascend them, contend for their share of air and light, and often ungratefully destroy the means whereby they climbed. Down in the shade below may live a few shrubs and herbs. But all, the herb, the shrub, the vine, and the tree agree in one respect: they expend almost all their power in prolonging and extending their individual existence. Were the powers of any one of them diverted to the elaboration of some generous fruit or seed or bulb, stored with abundant nutriment, its selfish rivals would overpower it and exterminate it. The forest, then, is no place for the date, the cocoa, the bread-fruit, nor for the cereal grasses; neither can man, nor the animals of his chase subsist in its depths. So that were the primitive condition of man the savage state, as some most falsely imagine, the forest never was his home. Degraded to a savage, he dwells within its skirts where it borders on plains of grass and bodies of water, but never far within.

Such being the case, when man proceeds to subdue his domain, he of necessity begins by lifting up his axe upon the thick trees. The space they occupied he fills with the plants he

brought with him from the verge of Eden, having added maize, and the potato and a very few others to his primitive stock. With these he feeds himself and his dependant animals. He wages a war of extermination against every other animal and plant, found within his territory, or near it, even including too often such animals as aid him in the destruction of the enemies of his crops. The quantity or weight of animal life within his domain is infinitely greater than when it was in a natural state. He tolerates but two carnivora, and them only to help him hold in subjection other animals or to destroy them. Man thus transforms the whole face of nature. Will any unsought changes attend upon those he brings about with his industrious toil? And if so, what changes?

Here is a question of incalculable moment, but one which no inquirer seems ever to have set himself to answer so thoroughly as Mr. Marsh in his Man and Nature. Led, apparently, by the extreme importance of this subject to posterity, he has gone back to the general question: What power man has over nature, and what permanent changes, designed, or undesigned, he is capable of impressing on the face of the globe. To this task he has brought a treasure of careful observation in many lands, and of extensive reading in many tongues, neglecting nothing that might even incidentally throw light upon it. His theme embraces not only the clearing of forests, but the fencing out the sea, and confining rivers to their beds by embankments, the fixing of moving sands, cutting canals, and boring artesian wells in the desert.

But though this range of topics gives the work the completeness of a scientific treatise, the central and moving idea of the work is the ruin caused by the destruction of forests. And to Americans this is a subject of peculiar importance. We trust we shall be excused, therefore, if we examine it to the comparative neglect of others.

But let us go back even one step farther than the Vermontese sage has gone, and inquire whether there is any power in damp or wet soil to attract moisture from the clouds. No scientific theory to prove or explain the existence of any such power is like to be satisfactory. Deposition from the clouds would seem to be little affected by the condition of the soil far beneath

them. But yet we more naturally anticipate the fall of rain on ground already moistened with repeated showers. Farmers say that the "heart of the drouth is broken" when the ground has once become really wet. There are seasons when different portions of the same county are quite unequally favored, one being parched continually, while the other receives numerous showers. Rains, too, are said to follow the course of streams; that is, to moisten the ground adjoining them to the exclusion of regions on either side.

Be that as it may, there is no doubt that the soil of the forest is far more damp than that of the cleared land. Some causes of this are obvious. The action of the sun and wind, the two great drying agencies, are mechanically impeded. The drops of rain are broken, and fall with less force, and are more readily drunk in by the decayed leaves than by naked soil. Further, as in warm weather the woods are cooler than the open country, moist air circulating through deposits some of its moisture there. Again, in the woods the ground freezes less, snow lies longer and till after the ground thaws, and the water, instead of running off in torrents, is absorbed on the spot, and contributes to the dampness of the soil.

So much for the action of a forest as mere dead matter. But it is, in reality, a mass of living organisms. How do vital forces affect the moisture of the soil? This question involves others on which vegetable physiologists are not agreed; nor do our views of them coincide entirely with those of Mr. Marsh. None doubt that the roots of plants absorb water holding mineral matter in solution, and that the leaves extract carbon from the air, and exhale water. Most believe that at some times leaves absorb water from the air, but this is not true to any great extent; for they will not at the same time imbibe and emit it, and in daylight the emission appears to be continuous. But that trees transmit water to the ground through their roots (p. 174), is not only unsupported by evidence, but contrary to all probability. It is not known "that there is a *current* of sap toward the roots," there being unquestionably at the same time a progress of crude sap in the contrary direction, and by the same medium. The leaves combine water from the root and carbon from the air into organic matter, and this is

diffused even to the roots. How? By a reflux of liquid? *Non constat.* The cellulose, or sugar, may pass from particle to particle of water by diffusion, or osmose. Gravitation would generally aid, for the leaves are normally the upper part of the plant, and the elaborated sap is heavier than the crude. On the whole, we can not doubt that the action of vegetation draws a vast amount of water from the ground, and throws it into the air, but still, far less than what the forest saves to the ground from the sun and the wind.

It is equally clear that the forest serves to moderate the extremes of temperature while it is above freezing. But it must not be forgotten that the act of freezing liberates heat. Now it seems (p. 162) that the open ground may freeze seven times as deep as that in the forest. So far the woods tend to exaggerate extreme cold. But Mr. Marsh's elaborate investigations of the influence of trees as living organisms on the temperature, though curious and interesting, are foreign to his purpose; for any possible amount they might throw out or withdraw, would be but an infinitesimal as affecting climate. Nor need he in ascertaining the sign and amount of that infinitesimal, have speculated so finely. If it be true that in flowering heat is evolved, it need not surprise us, as carbonic acid is also thrown off, and the course of vegetation is reversed. Still, the quantity of heat disengaged is exceedingly minute, and rarely detected. But the tree keeps its own ledger: as much heat as there is latent in the stem, the branches and the root, just so much is the excess that it has in all its life drawn in from the rays of the sun over and above what it may have in any way evolved. But all this heat is surrendered again when it is burned in the kitchen fire, under the steam-boiler, or in a conflagration of the forest: and just as surely is all this heat returned in the process of decay, which is therefore called eremacausis* — slow combustion.

But when the wood is buried below decay, to be converted into coal in future ages, its heat is lost to this generation. On the other hand, the burning of the coal and kerosene taken from the depths of the earth, is restoring to the atmosphere heat lost

*The derivation of Eremacausis is wrongly given in the last edition of Webster: ἠρέμα signifies *slowly*.

to it ages since, and, so far as it goes, actually increases the mean temperature of this century. As to what is copied from Meguscher concerning the specific heat of trees, a temperature above that of the atmosphere, as we would find it in a living animal (p. 157), we do not believe a word of it. The act of growth lowers the temperature of the living tree, but to a degree inappreciable to the most delicate instrument that can be imagined.

Observations can do little towards showing the effect of clearing off the forest upon either the mean or the extremes of temperature. Local effects from removing patches of wood, and thus admitting the north wind or the south will, of course, occur everywhere; but if our winters are becoming milder, as some imagine, no instrument has shown it. Observations began so lately, and they vary so with the position of the instruments, that they show, as yet, no secular changes, either in temperature or moisture.

The removal of forests plainly influences springs and streams. The snow that falls in the woods mostly sinks into the ground and feeds springs. Much of that which falls on cleared land and melts while the earth is still frozen goes to swell the spring floods. In the same way the rain that falls on cleared ground is detained less, and more passes off in floods. Hence none can doubt that, as a country becomes cleared, its springs must disappear and its streams become more variable in volume. Springs may be re-established by allowing the wood again to grow. "I remember one case," says Mr. Marsh, (p. 197), "where a small mountain spring which disappeared soon after clearing the ground where it rose, was recovered about ten or twelve years ago by simply allowing the bushes and young trees to grow up on a rocky knoll not more than half an acre in extent immediately above it, and has since continued to flow uninterruptedly."

But the next question, whether the amount of rain is diminished by clearing the country of its forests, is not so easy to answer; and yet it is a question of the highest importance. Undoubted facts on this point we have none: opinions and theories are numerous, mostly tending to favor the idea that the diminution of the forest diminishes the amount of rain. When

the wind drives a cloud, mist or fog against a tree, no one doubts that the water is arrested. But when the cloud is above the forest? Now if we knew that moist ground could draw rain from clouds far above it, or if we had reliable observations for a long series of years, or anything else but conflicting opinions and disputed facts, it were better than it is. Still the great mass of opinion and evidence is all on one side. Clavé, Boussaingault, Blanqui, Schacht, Coultas, Sir J. F. W. Herschell, Hohenstein, Barth, Asbjörnsen, Babinet, Monestier-Savignat and Mignet are cited, and "numerous other authorities might be cited in support of the proposition that forests tend, at least in certain latitudes and at certain seasons, to produce rain; but though the arguments of the advocates of the doctrine are very plausible, not to say convincing, their opinions are rather *a priori* conclusions of observation from general meteorological laws, than deductions from facts, and it is remarkable that there is so little direct evidence on the subject." p. 193.

Perhaps the best direct evidence is that afforded by Lake Valencia, west of Caracas, in Venezuela. It has no outlet, and maintains itself of such size as is necessary to dispose of the rain that falls in the beautiful valley of Aragua. As it became settled, the lake diminished: an island on which stood the important fortress of Cabrera became a peninsula, and new islands appeared. In the war of independence this region was almost depopulated and plantations again became forest. The result could have been anticipated: the water rose again till the lake had acquired sufficient surface to evaporate the increased amount of rain. p. 202.

In countries peculiarly exposed to damage from hail it is universally believed that this scourge is rendered more destructive by cutting down the forest. p. 140. If this be true, it would certainly not be strange if the same agency that prevents hail might induce rain. And if this be so, if rains have been induced in Egypt by the recent extensive plantations of trees, if the deserts of Arabia are the direct result of human devastations, is there any region between the polar circles of which we need absolutely despair? "The hard palate and tongue and strong teeth and jaws" of the camel keep down all vegetation of the desert save the bitter colycinth, the poisonous foxglove and per-

haps the tamarisk." (p. 132). Who can tell but, in a more populous age of the world, cactus hedges may complete the work that artesian wells have begun, and Sahara itself become a fertile and beautiful land?

Other and dire results of the destruction of forests are not doubtful. The roots of the trees hold the soil in place and retard the rush of the water to the streams. Remove them and often the surface of the ground will assume a new shape. Deep gullies with innumerable ramifications run down to the streams in the vallies. The side of these are very steep and at length cover the whole area of the denuded land. Each drop of rain falls on a steep inclined plane and rolls instantly down into the bed of a miniature torrent. Hardly is the ground wet, before ten thousand of these little affluents have united into a formidable torrent that thunders down to the stream below, bearing with it earth, gravel, shingle and even enormous rocks. Other torrents join in the mischief. The stream passes all bounds. Bridges, dams and mills are swept away. Soon the water subsides leaving vast fertile meadows covered with sterility.

No mere theory or vague statements are sufficient to duly impress the extent of this evil upon those who have laid themselves open to it so recklessly as the farmers of New England. The astounding results in the remote East also become more credible after considering what is now passing in the southeast of France. We therefore quote somewhat at large from Blanqui, as cited by Mr. Marsh. He is speaking of the western slope of the Alps, about midway between Geneva and the Mediterranean:

"If you overlook from an eminence one of these landscapes furrowed with so many ravines, it presents only images of desolation and death. Vast deposits of flinty pebbles, many feet in thickness, which have rolled down and spread far over the plain, surround large trees, bury even their tops, and rise above them, leaving to the husbandman no longer a ray of hope. One can imagine no sadder spectacle than the deep fissures in the flanks of the mountains, which seem to have burst forth in eruption to cover the plains with their ruins. These gorges, under the influence of the sun which cracks and shivers to fragments the very rocks, and of the rain which sweeps them down, penetrate deeper and deeper into the heart of the mountain, while the beds of the torrents issuing from them are some

times raised several feet in a single year by the debris, so that they reach the level of the bridges, which, of course, are then carried off. The torrent beds are recognized at a great distance, as they issue from the mountains, and they spread themselves over the low grounds, in fan-shaped expansions like a mantle of stone, sometimes ten thousand feet wide, rising high at the centre, and curving toward the circumference till their lower edges meet the plain.

"Such is their aspect in dry weather. But no tongue can give an adequate description of their devastations in one of those sudden floods which resemble, in almost none of their phenonema, the action of ordinary river water. They are now no longer overflowing brooks, but real seas, tumbling down in cataracts, and rolling before them blocks of stone, which are hurled forward by the shock of the waves like balls shot out by the explosion of gunpowder. Sometimes ridges of pebbles are driven down when the transporting torrent does not rise high enough to show itself, and then the movement is accompanied with a roar louder than the crash of thunder. A furious wind precedes the rushing water and announces its approach. Then comes a violent eruption, followed by a flow of muddy waves, and after a few hours all returns to the dreary silence which at periods of rest marks these abodes of desolation.

"This is but an imperfect sketch of this scourge of the Alps. Its devastations are increasing with the progress of clearing, and are every day turning a portion of our frontier departments into barren wastes.

"The unfortunate passion for clearing manifested itself at the beginning of the French Revolution, and has much increased under the pressure of immediate want. It has now reached an extreme point, and must be speedily checked, or the last inhabitant will be compelled to retreat when the last tree falls.

"The elements of destruction are increasing in violence. Rivers might be mentioned whose beds have been raised ten feet in a single year. The devastation advances in geometrical progression as the higher slopes are bared of their wood, and the 'ruin from above,' to use the words of a peasant, 'helps to hasten the desolation below.'

"The Alps of Provence present a terrible aspect. In the more equable climate of Northern France one can form no conception of those parched mountain gorges where not even a bush can be found to shelter a bird, where, at most, the wanderer sees in summer here and there a withered lavender, where all the springs are dried up, and where a dead silence, hardly broken by even the hum of an insect, prevails. But if a storm bursts forth, masses of water suddenly shoot from the mountain heights into the shattered gulfs, waste with-

out irrigating, deluge without even refreshing the soil they overflow in their swift descent, and leave it more seared than it was from want of moisture. Man at last retires from the fearful desert, and I have, the present season, found not a living soul in districts where I remember to have enjoyed hospitality thirty years ago." pp. 244—246.

Again on page 242: "Between Grenoble [in Isére] and Briançon [Hautes Alpes] in the Valley of the Romanche, many villages are so destitute of wood that they are reduced to the necessity of baking their bread with sun-dried cowdung, and even this they can afford to do but once a year. This bread becomes so hard that it can be cut only with an axe, and I have myself seen a loaf of bread in September at the kneading of which I was present the January previous."

The extent of these desolations, even a hundred years ago, may be seen from a citation from Ribbe on page 239:

"Commune of Barles, 1707: Two hills have become connected by land slides and have formed a lake which covers the best part of the soil. 1746: New slides buried twenty houses composing a village, no trace of which is left; more than one third of the land has disappeared.

"Monans, 1724: Deserted by its inhabitants, and no longer cultivated.

"Gueydan, 1760: It appears by records that the best grounds have been swept off since 1756, and that ravines occupy their place.

Digne, 1762: The river Bléone has destroyed the most valuable part of the territory.

"Malmaison, 1768: The inhabitants have emigrated, all their fields having been lost."

Now it must be noted that the scene of this ruin was, up to the close of the fifteenth century, well-wooded, protected from erosion by artificial barriers of rock; and, in point of soil and climate, one of the most delightful regions on earth.

The causes of this desolation, the world over, is set down by our author, in a great degree, to oppression, monarchical, feudal and ecclesiastical; and next to these, the ravages of war. The operation of these causes is somewhat familiar to us in the Holy Land. A large part of the fuel of Jerusalem, we are told, is of the roots of olive trees, dug chiefly from groves that disappeared before the memory of man. The forest laws of mediæval France are an especial abhorrence of the son of the Green Mountains. In one case, this seems to have been exas-

perated by a brutal pun that the philosopher seems not to have detected in Bonnemère. "The death of a hare was a hanging matter, the murder of a plover a capital crime. Death was inflicted on those who spread nets for pigeons; wretches who had drawn a bow upon a stag were to be tied to the animal alive, and among the seigniours it was a standing excuse for having killed game on forbidden ground that they aimed at a serf." p. 281. Now it may be that cervicide was surer of punishment than servicide; but when we reflect that with these jesting worthies *cerf* meant a stag, and *serf* a bondman, charity bids us give them credit for a grim joke at the expense of these same murderous laws. We commend these usages of the *ancien regime* to the consideration of those who maintain that each generation of the world is more wicked than the preceding.

Still, a better government will not always protect the forests. The fall of the French monarchy gave licence to the woodcutter. Free governments are not as efficient as is desirable. It is astonishing to a republican, that the royal forests of France yield a greater profit under official management than those which are private property and managed by their owners. But then these officials are not appointed to the charge of national property merely because they are fit for no other business. The lands of our own national domain are plundered without scruple even by men who consider themselves honest.

If, then, we are to rely largely on individual interest for the maintenance of sufficient forest to keep our country from becoming a desert, it is well to enquire what profits can be drawn from woodlands. This, of course, depends upon the mode of managing them. Our common way is to make of them a cattle-walk till the wood is wanted, and then cut them down, and sow the ground to wheat. Or, if it is not to be converted into a field or pasture, the dead trees are cut out and such living ones as necessity or fancy shall dictate. It is quite otherwise in Europe. There arboriculture is a science, and its various schemes are amply discussed. Mr. Marsh has added much to the value of his book by devoting a dozen pages to this neglected topic.

We can pause to speak of but two systems, the tallis or

coppice, and the futaie or full-growth systems. The coppice is cut over clean after a growth of between fifteen and forty years. Of course this system makes no large timber and, as all the new wood is from old roots, it ultimately loses its vigor.

"The former mode of treating the futaie, called the garden system, was to cut the trees individually as they arrived at maturity, but, in the best regulated forests, this practice has been abandoned for the German method, which embraces not only the securing the largest immediate profit but the replanting of the forest, and the care of the young growth. This is effected in the case of a forest, whether natural or artificial, which is to be subjected to regular management, by three operations. The first of these consists in felling about one third of the wood, in such way as to leave convenient spaces for the growth of young trees. The remaining two thirds are relied upon to replant the vacancies by natural sowing which they seldom or never fail to do. The seedlings are watched, are thinned out when too dense, the ill-formed and sickly, as well as those of inferior value, and the shrubs and thorns which might otherwise choke or too closely shade them, are pulled up; when they have attained sufficient strength and development of foliage to bear or to require more light and air, the second step is taken by removing a suitable proportion of the old trees which had been spared at the first cutting; and when, finally they are hardened enough to bear frost and sun without other protection than that which they mutually give to each other, the remainder of the original forest is felled and the wood now consists wholly of young and vigorous trees. This result is obtained after about twenty years. At convenient periods afterwards, the unhealthy stocks and those injured by wind and other accidents are removed, and in some instances the growth of the remainder is promoted by irrigation and fertilizing applications. When the forest is approaching to maturity, the original processes already described are repeated; and as, in different parts of an extensive forest, they would take place in different zones, it would afford indefinitely an annual crop of firewood and timber." pp. 318—321.

What the author says about terracing ground for the growth of trees, and the application of irrigation and manures, need not be repeated here, as we can hardly expect to see these precautions taken in the New World in our day.

What are the profits of a well-regulated woodland? This is an interesting question with us in more than a mere financial point of view. If there is danger that our country will go to

ruin bodily by the denudation of its forests, we would be glad to assure ourselves that in the course of time the rise of price of wood, with the natural diminution in the rates of interest, and improvements in arboriculture, would restore to our dry and rocky hills their waving honors, resuscitate the dried fountains, and replace the stony beds of torrents, with trout-brooks, and mill-streams. So we turn with no little solicitude to the statistics on page 327:

"The planter of a wood must be actuated by higher motives than those of an investment the profits of which consist in direct pecuniary gain to himself or even to his posterity; for if, in rare cases, an artificial forest may, in two or three generations, more than repay its original cost, still, in general, the value of its timber will not return the capital expended and the interest accrued.*"

Small encouragement this for the replanting of the land that we have wantonly stripped of its natural covering and, too often, of the very soil itself. But something must be done. The full effects of our fathers' transgressions are not yet manifest, for we are assured that in those portions of New England where the proportion of wood has not decreased for a century, the desiccation of the soil, and the decrease of springs and streams have not ceased. We are wasting our heritage, living on the principal and leaving a desolation to posterity. In the energetic language of Mr. Marsh, (p. 55,) "we are, even now, breaking up the floors and wainscoting and window-frames of our dwelling for fuel to warm our bodies and seethe our pottage." The most tyrannical administration of arbitrary power has proved inadequate to the protection of the forests of Europe: we well know how weak our laws are against every thing

"* According to Clavé (Etudes, p. 159,) the net revenue from the forests of the State in France, making no allowance for the interest on the capital represented by the forest, is two dollars per acre. In Saxony it is about the same, though the cost of administration is twice as much as in France; in Würtemberg it is about a dollar an acre; and in Prussia, where half the income is consumed in the expenses of administration, it sinks to less than half a dollar. . . . . Taking into account the capital invested in forest land, and adding interest upon it, Pressler calculates that a pine wood, managed with a view to felling it when eighty years old, would yield only one eighth of one per cent. annual profit; a fir wood, at one hundred years, one sixth of one per cent.; a beech wood, at one hundred and twenty years, one fourth of one per cent. The same author (p. 335), gives the net income of the New Forest in England, over and above expenses, interest not computed, at twenty five cents per acre only. In America, where no expense is bestowed upon the woods, the annual growth would be generally estimated much higher."

that our worst men do not admit to be crime. No one thing that we can think of would do more to arrest the evil than the publication of "Man and Nature." Many things that we very well know have no controlling effect on us, and among them might be the consequences of excessive wood-cutting. "Woodman, spare that tree!" is mere matter of song; but the stern picture Mr. Marsh holds up to us cannot fail to produce a good impression.

Still, let law do what law can. Something may be accomplished by means of taxation. If a citizen is cherishing a piece of wood that yields him an annual return of "one eighth of one per cent" on the capital invested, but which is of priceless value to lovers of green fields, cool springs, and equable streams; let us not tax him as if hoarding land for speculation. Nothing, we imagine, will be done efficiently in any State while the highways are pastured. Let the States that forbid this practice put a high minimum valuation upon all lands used for pasturage or tillage, assess wood land only in proportion to the value that can annually be taken off of it, without deteriorating the property, and further lay an income-tax on stripping the land of its timber, and the evil will have culminated. The three immediate enemies to the forest are the teeth of domestic animals, the axe and the devouring element; and the last seldom can go where the others have not preceded; or, if that shall happen in some excessively dry season, as at Miramichi in 1825, in twenty-five years the waste is "thickly covered again with trees of fair dimensions, except where cultivation and pasturage keep down the forest growth." p. 28. Were man, the exterminator, exterminated, there would not be, in a century after, a woodless acre east of the Mississippi, and it might be that after the lapse of a chiliad or two the Great American Desert, the Occidental Sahara, would be covered with lofty trees, and in the Jornada del Muerte murmuring streams would refresh the prey of the puma and the jaguar.

And can not civilized, enlightened man cease his suicidal folly and make amends for it so far as to accomplish all that unaided nature would do? Perhaps there shall yet come a good time for our land when we shall no longer depend on idlers and vagabonds to select our candidates for office. If so, we may

hope for an attempt to solve the problem how arid, how sterile, and how steep a surface it is possible to cover with forest.

"No agencies now known to man and directed by him," says our author, (p. 45,) "seem adequate to the reducing of great Alpine precipices to such slopes as would enable them to support a vegetable clothing, or to the covering of large extents of denuded rock with earth, and planting upon them a forest growth. But among the mysteries which science is yet to reveal, there may be still undiscovered methods of accomplishing even grander wonders than these. Mechanical philosophers have suggested the possibility of accumulating and treasuring up for human use some of the greater natural forces, which the action of the elements puts forth with such astonishing energy. Could we gather, and bind, and make subservient to our control, the power which a West Indian hurricane exerts through a small area in one continuous blast, or the momentum expended by the waves, in a tempestuous winter, upon the breakwater at Cherbourg, or the lifting power of the tide for a month at the head of the Bay of Fundy, or the pressure of a square mile of sea water at the depth of five thousand fathoms,* or a moment of the might of an earthquake or a volcano, our age—which moves no mountains and casts them into the sea by faith alone—might hope to scarp the rugged walls of the Alps and Pyrenees and Mount Taurus, robe them once more in a vegetation as rich as their pristine woods, and turn their wasting torrents into refreshing streams."

But are there not powers of nature now applicable by us that may effect the desired changes? Geologists suppose that the Alps were once higher, steeper and barer than they will ever be again. We know not that the intervention of creative power was necessary to grade them down and clothe their steep slopes. The botanist has not yet searched through all the flora of the earth in quest of the plants most suitable for this purpose. Nay, should the selection be left to nature, and it be required of man only that he and his overgrown family of domesticated animals should not interfere with her operations, all she asks is time. But it is not enough that man stand neutral. He has wrought the desolation, let him do his utmost to repair it. Once really intent on the problem, we think he will solve it.

Grant that to convert the centre of our continent into habita-

* We believe this pressure can not be called a "force put forth."

ble land would cost the nation more than it would sell for; is it money thrown away? Holland recovered the bed of Haarlem lake, some forty odd thousand acres, to agriculture at a pecuniary loss of a half million dollars and interest. But it was not money lost. Mr. Marsh wisely observes, (p. 351),

"The excess of governmental expenditure over the receipts, if employed in constructing ships of war or fortifications would have added little to the military strength of the kingdom; but the increase of territory, the multiplication of homes and firesides which the people have an interest in defending, and the augmentation of agricultural resources constitute a stronger bulwark against foreign invasion than a ship of the line or a fortress armed with a hundred cannon."

If this be true of a lake of placid water changed to farms, how much more true would it be of a desert?

We have given to this one topic a space quite disproportionate to what it occupies in the book; but in its real importance it is disproportionate in the opposite sense. The other matters in the book can better be dismissed in a few words. They do not come home so much to our own business and bosoms.

Man's sovereignty over nature is exercised mainly over animals, plants and other moving bodies whose motions he can to a degree control and direct. These last are only water and sand. Leaving the organic world, our author proceeds to man's ameliorating his abode by his management of the water. He dykes the rivers to confine them to their beds, and old ocean to dispossess him of a part of his. The pumping out of Haarlem lake, a body of water fifteen miles long by seven wide — the great Leeghwater engine driving eleven pumps, each throwing 1585 gallons (more than fifty barrels) per stroke — this seems the utmost human achievement yet. The improvement of the Tuscan sea-coast added more to human happiness still. The Etruscans kept the country drained and healthy till conquered by Rome. Afterwards the forests were sent to Rome, and the improvements were neglected. It became and continued to be a pestilential region till, in 1827, a work of amelioration commenced which reduced the annual cases of fever from 35,629 to 9,200 in 1844: the work is still in progress.

Irrigation is more extensively practiced over the world than we would at first suppose. We are informed that it yields products

of an inferior quality, is hostile to a subdivision of property and exposes the agriculturist to oppression, favoritism and wrong from the administrators of the water. It seems a pity that the practice should extend, as it will and must.

Drainage tends to aggravate torrents by facilitating the rapid escape of the rain that falls on the land, but otherwise is of permanent, incalculable service.

Canals for navigation not only affect all human agencies in the region through which they pass and those which they connect; but introduce into one region the water-plants and animals native to another.

We are rather amazed at the author's idea of the extent of subterranean streams and reservoirs. The success of artesian wells, (wells from which the water rises to or above the level of the ground), implies at least a bed of gravel, or crevices of rock filled with water, but not necessarily natural aqueducts and cisterns. Still, our utmost ideas may fall short of the reality. Mr. Marsh, (p. 436,) speaks of "underground rivers, like those in the great caves of Kentucky, which may gush up in fresh-water currents at the bottom of the Carribean Sea, or rise to the light of day in the far-off peninsula of Florida."

Most certainly the mill streams of Argostoli, in the island of Cephalonia, are a great curiosity, streams of sea-water that fall into cavities in the earth. One has a width of "five feet and a half and a depth of a foot: the water pours rapidly through the canal into an irregular depression, and forms a pool, the surface of which is three or four feet below the adjacent soil, and about two and a half or three feet below the level of the sea. From the pool it escapes through several holes and clefts in the rocks and has not been seen to emerge elsewhere." p. 434. The bay of Argostoli is like that of Fundy in shape and direction; it is a pity that the accurate observations made there have not included the tides and winds. If the streams flow with all winds and at all tides, they furnish a hard problem to solve.

But what is an artesian well? The original well at Artois was bored, was of small diameter, and the water flowed out at the top. Bored wells from which the water is drawn in a tubular bucket are not uncommon at the West. Exactly the reverse

of these are wells dug by the Moors "in the Lybian desert bordering upon the cultivated shores of the Mediterranean," "square shafts lined with a frame-work of palm tree stems." "The wells so constructed, although not technically artesian wells, answer the same purpose; for the water rises to the surface and flows over it as from a spring:" p. 443. Though Webster says "they are usually of small diameter and of great depth," we would (with Mr. Marsh's permission) assign the self-flowing property as the one which makes the well technically artesian. "The French have bored a large number of artesian wells in the Algerian desert within a few years. . . If the supply of water shall prove adequate to the indefinite extention of the system, it is probably destined to produce a greater geographical transformation than has ever been effected by any scheme of human improvement." pp. 444, 5.

Few of our readers have seen enough of moving sands, particularly of sands moved by the wind, to feel a particular interest in Mr. Marsh's fifth chapter. Many of them have never even seen a dune. Some may not know how with slow, remorseless progress it may overwhelm a village, and after hiding it from the light of day for centuries at length leave it in the rear, a well preserved relic of antiquity. Sand, we are told, never flies, but hops; it never overwhelms caravans. The roots of various plants will hold sand stationary. The ailanthus has proved invaluable for this purpose in the steppes near Odessa. A dune well fixed on the sea-shore is a cherished boon to those whose lands are by it protected from spray and flying sand. But the burrowing of a rabbit lays open the whole hill, if neglcted, to the attacks of the wind which may spread it in desolation over the land to the leeward.

Mr. Marsh concludes with a chapter on projected or possible geographic changes. Lowering Lake Superior, drawing water from Lake Michigan to the Illinois, and from Niagara River into the valley of the Genesee come nearest to us of all these. Ellett's scheme of a reservoir to remedy the low water of the Ohio, seems to have escaped his notice. He certainly can never have seen it. The cutting of the Isthmuses of Darien, Suez, Corinth and Gallipoli, letting water into the Dead and

Caspian Seas, and the draining of the Zuider Zee are among the most noteworthy of the rest.

We do not reach the conclusion of this book without regret. We rarely come to be so well acquainted with the author of a work of this kind, certainly not to esteem him so, by the mere perusal of a treatise. Mr. Marsh has represented his country abroad and we fear he has been an exceptional case among our diplomatists. To speak English better or worse, to be good on the stump, to have aided efficiently in electing the president, and to have powerful influences at his control, have too often been the first, if not the only, prerequisites to a foreign mission. We thank our Executive for a man with an open eye, an open heart, and an open hand. While not deeply versed in scientific lore, he commands the respect and attention of scientific men. The *obiter dicta* of the book show a wide range of thought and arrest attention. The education of the eye, the use of tobacco, the conscience of corporations, bird-murder, etc., etc., are all welcome to the space they occupy.

There is no paragraph in the whole book that has puzzled us more than the following from page 68: "Humboldt and Bonpland found among the unquestionably indigenous plants of tropical America, monocotyledons only, all the dicotyledons of those extensive regions having been probably introduced after the colonization of the New World by Spain." All the trees of the untrodden forests of the Amazon and the Orinoco, the Magdalena and the Cauca introduced! All the cacti and the passion-flowers, the potato (p. 73,) and tobacco (p. 63,) natives of the Old World! Clearly some other words should have stood in the place of *monocotyledons* and *dicotyledons*, but what? Conjecture is here utterly at fault.

It is impossible to lay down this interesting book without a glance at the future. The area of cultivable wilds in the temperate zones is rapidly diminishing. In a very few years all the territory of the United States capable of agricultural improvements will be scattered over with farms. Not much longer will desirable locations in virgin soil invite the emigrant from the teeming hives of Europe. Though some baleful secret influence seems to have diminished greatly the fecundity of Christian and refined families of the Anglo-Saxon race within

the last fifty years, still the population of the world has never increased so rapidly as now. And, unless some abomination that maketh desolate shall prevail, the ratio of increment shall itself increase till a million a day shall be the normal augmentation of the population of our globe. Where shall this multitude that no man can number find homes? We would invite Mr. Marsh's attention to the low, miasmatic, but fertile, lands within the tropics. So strong is nature there that man has made no visible progress towards the mastery. But were these regions occupied by a population of several hundred to the square mile, and every square yard thoroughly subdued, all the boundless basins of the Amazon and the Niger would become as the garden of the Lord. Is there any other respect, save a dense though barbarous population, in which the basin of the Ganges and the Irawady now excel them? The present population of the world could be maintained by the valley of the Amazon alone. And if so be that knowledge and virtue shall increase with increasing numbers, that wise human agencies shall have repaired all the damage done to the fair face of nature by human folly, and the ravages of sin be all done away by the preaching of the Gospel of Christ and Him crucified, how glorious will be the complete history of our globe; ruined, ravaged, wasted and almost destroyed by sin, and then restored, beautified and made all glorious by salvation!

ARTICLE V.

THOU WILT NOT LEAVE MY SOUL IN HELL.

BY Z. S. BARSTOW, D. D., KEENE, NEW HAMPSHIRE.

Hebrew: כִּי לֹא־תַעֲזֹב נַפְשִׁי לִשְׁאוֹל

Septuagint: *ὅτι οὐκ ἐγκαταλείψεις τὴν ψυχήν μου εἰς ᾅδην.*

Apostles' Creed: He descended into Hell.

VOLUMES of lore have been written upon these words of the Psalmist, and upon "the creed" in different ages of the church; as if the whole value of Christ's coming depended upon his having "descended into hell to liberate the souls" of those there confined.

But this clause was not in "the creed" during the first four centuries of the Christian era. Neither Irenæus nor Origen nor Tertullian seem to have ever heard of this phraseology; nor was it expressed in the creeds that were put forth at Ephesus or Chalcedon, Sardis or Antioch; nor is it mentioned by Eusebius at the Council of Nice, though he there put forth a creed for their consideration. Nor was it in that which was presented to Pope Julius by Marcellus.

But it was adopted by the church at Aquileia somewhere about A. D. 400, and yet it was not as now, "He descended into hell," but "descendit in inferna," or "ad infernum." This is the general reading of the ancient MSS.

It was afterward found in the Roman creed about A. D. 785; for it was then urged by Etherius against an antagonist; though some say that it was more anciently in the creed falsely attributed to Athanasius. It was in the creed of the fourth Council of Toledo, A. D. 633, and it has been held sacred from that time to the present.

And yet there have been great discrepancies as to the meaning of the phraseology. Some have made it mean "the lower parts of the earth," as in the words of Paul in Eph. iv. 9. Several passages of Scripture have been thought to contain the same doctrine; especially that in I. Peter, xiii. 19: "For Christ was put to death in the flesh, and quickened by the Spirit; by which also he went and preached to the spirits in prison." But plainly this passage has no bearing upon the subject; for it merely asserts that Christ by the Spirit went and preached to those who are now spirits in prison; viz: those that were disobedient while the ark was preparing in the days of Noah. It has not a word to say concerning liberating those antediluvians from prison.

But next followed the horrible doctrine that Christ not only "descended into hell," but that he "also suffered the torments of hell." And thus it was argued by one of the fathers: "Si Christus ad inferos descendisse dicetur; nihil mirum est, cum eam mortem pertulrit quæ sceleribus ab irato Deo infligitur."

But it is most astonishing that any sane man could have supposed it possible for Christ to feel remorse of conscience, or the fearful displeasure of God the Father.

The next notion that was entertained seems to be nearly the same as that of Greeks, Etruscans and Romans, that Christ went to the place of the dead; from which came probably the doctrine of purgatory, a place into which both good and bad descended; the "Limbus Patrum;" a place distinct from this where we live, and also distinguished from that to which Christ went when he ascended again on high. And even Clemens Alexandrinus thought that the soul of Christ preached salvation in Hades while his body was in the grave. And at that time the fathers seem to have made Hades to have two receptacles, one for the good and one for the bad; somewhat as Virgil has it:

> Hic locus est, partes ubi se via findit in ambas.
> Dextera, quæ Ditis magni sub mœnia tendit;
> Hâc iter Elysium nobis. At læva malorum
> Exercet pœnas, et ad impia Tartara mittit.
>
> Æn. 6: 540—43.

But, again, others maintained that Hades or Infernus was never taken in the Scriptures as the place of happiness, or that there was need to deliver patriarchs and prophets from that place of the dead.

But enough has been said of these different notions of the fathers, which may be compared to what Grotius said of his own life spent "operóse nihil agendo." And as Le Clerc has well said in his commentary upon Ps. xvi. 10: "Hic videmus creditam animam Christi fuisse in inferno, hoc est, loco animarum huminarum, dum corpus fuit in sepulcro. Quæ prava interpretatio ab omnibus recepta est quasi vera, ob Linguae Hebraicæ ignorantiam."

And now let us look at the text itself whence all this varied lore was supposed to be derived. שְׁאוֹל that is here rendered hell is employed in sixty passages, which by the LXX are all rendered by ᾅδης and in very many of these passages שְׁאוֹל means unquestionably "the grave." See the following as a specimen of the rest: Gen. xxxvii. 35: "I will go down into the grave unto my son mourning." Gen. xlii. 38; and xliv. 29: "Then shall ye bring down my gray hairs with sorrow to the grave." Numb. xvi. 30, and 23: "They went down alive into the pit." I. Kings ii. 6: "Let not his hoar head go down to the grave in peace." Job vii. 9: "So he that goeth down to the grave shall come up

no more." Job xiv. 13: "Oh that thou wouldest hide me in the grave." Job xvii. 13: "If I wait the grave is my house." Job xxi. 13: "In a moment go down to the grave." Ps. vi. 5: "In the grave who shall give thee thanks?" Prov. i. 12: "Let us swallow them up alive as the grave." Prov. xxx. 16: "The grave . . . saith not it is enough." Isa: xiv. 11: "Thy pomp is brought down to the grave." And so we might proceed much fu: ther showing that שְׁאוֹל more commonly perhaps means the grave than Hell itself; though it often means the place of punishment.

Why then may we not believe that this word means the grave in Ps. xvi. 10? Is there any valid argument against it? Nay, does not necessity require it? We think it will appear so before we finish this discussion.

We turn next to נַפְשִׁי here rendered, my soul. This word נֶפֶשׁ is employed several hundreds of times in the Old Testament, where it is rendered ψυχή by the LXX. In a very large number of these passages the word seems to mean the mind, the soul, the immortal part of man.

And yet there are quite a number of passages where it means "cadaver," a corpse, a body from which the νοῦς has fled. And in these passages the Hebrew word נֶפֶשׁ means the same as ψυχή. Numbers vi. 6: "All the days that he separateth himself unto the Lord he shall come at no dead body." Levit. xxi. 11: "Neither shall he go in to any dead body." Numb. xix. 11: "He that toucheth the dead body of any man;" and also in verse 13th: "Whosoever toucheth the dead body of any man that is dead." The same is true of Lev. xxi. 1; and Haggai ii. 13. So we see that there are, at least, seven passages where both the Hebrew and the Greek words above referred to mean simply "cadaver," a corpse, a body from which the νοῦς has departed.

Now we ask, why may they not mean simply this in Psalm xvi. 10? Is there anything in the exigency of the passage that forbids it? Nay, rather is there not much that demands it?

Professor Noyes, who is a good Hebrew scholar when he is not warped by his theology, thus renders the clause; "For thou wilt not give me up to the grave." And turn next to Acts ii. 25, 31: "For David speaketh concerning him; I foresaw the Lord

always before my face; for he is on my right hand that I should not be moved. Therefore did my heart rejoice, and my tongue was glad; moreover also my flesh shall rest in hope; because thou wilt not leave my soul in hell; neither wilt thou suffer thy Holy One to see corruption. Thou hast made known to me the ways of life; thou shalt make me full of joy with thy countenance. Men and brethren, let me freely speak unto you of the patriarch David, that he is both dead and buried, and his sepulchre is with us unto this day. Therefore, being a prophet, and knowing that God hath sworn with an oath to him, that of the fruit of his loins according to the flesh, he would raise up Christ to sit on his throne, He, seeing this before, spake of the resurrection of Christ." What means it, but that his dead body was not left in the grave? And now observe the paral lelism which conveys the same idea in different words: "Neither his flesh did see corruption."

We therefore make one appeal to thinking men if Ps. xvi. 10 is not this; "Thou wilt not leave my dead body in the grave; thou wilt not suffer thine Holy One to see corruption"? And that Christ did not descend into hell, "in inferna," "ad infernum" or "Hades" in any of the senses above described, is clearly evident from what He said to the penitent upon the cross: "This day shalt thou be with me in Paradise."

ARTICLE VI.

SHORT SERMONS.

"For my people have committed two evils; they have forsaken me the fountain of living waters, and hewed them out cisterns, broken cisterns, that can hold no water."—*Jeremiah* ii. 3.

Fountains or natural springs are among the most beautiful, useful and permanent objects. Successive nations and races have drunk from some of them as the tide of life has swept downward. Oriental taste and art have always delighted to beautify their cities with convenient and elegant fountains. They form a frequent biblical allusion to describe great prosperity to individuals and communities.

On the contrary, a cistern is the emblem of the transient, the fitful, the not self-sustained. It is full or empty as exterior circum-

stances shall determine. A whole cistern is not a reservoir of steady dependence; but a broken cistern is utterly worthless. This, then, is the representation of God concerning himself and Israel. They had left him, the fountain, for the broken cistern.

I. Of what is God the fountain?

II. What is the evil of forsaking him for the cisterns of the world?

I. God is the fountain

(*a.*) Of spiritual illumination. All knowledge is in Him—the types and moulds of all existent and possible things; the insight of universal truth. "His understanding is infinite." The architect of the universe understands all its details, properties, forces, uses. His perception of beauty is the true standard of taste. His sense of what ought universally to be is the clue to the correct science of criticism.

Especially is He the fountain of moral and religious illumination. The theology which is drawn alike from his works and words he must interpret, to save the student from scepticism and false doctrine.

(*b.*) God is the fountain of grace—through the atonement of his Son: and,

(*c.*) Of practical righteousness — through the regenerating and sanctifying work of the Spirit: and,

(*d.*) Of endless, perfect glory—the result of the former in every renewed soul.

II. What is the evil of forsaking Him for the earthly cisterns?

(*a.*) Their contents are uncertain. Cisterns are not fountains: and,

(*b.*) While these contents do last, the enjoyment of them is not satisfactory: besides,

(*c.*) These draughts of worldly, selfish, sinful delight are positively poisonous and destructive of our spiritual life.

All this is susceptible of the amplest illustration from history and social life. New chapters of the never finished book of Ecclesiastes are continually multiplying the proofs of the "vanity and vexation of spirit" of living and dying "without God in the world."

"Why art thou cast down, O my soul, and why art thou disquieted within me? Hope thou in God, for I shall yet praise him who is the health of my countenance and my God."—*Psalms* xlii. 11.

David is in a sad condition, because at war within himself. His religious emotions are much depressed, while his understanding en-

courages him. His feelings are one way, and his good judgment the other. We have here a striking case of

Religious Despondency.

This is no uncommon state, and so it is eminently practical to inquire into its cause and remedies.

I. The cause or causes of religious despondency.

1. It may be because one is not a child of God. If not, he may be reasonably depressed. If one has (*a.*) no true sorrow for his sins; (*b.*) no tender anxiety to please God; (*c.*) can not go freely to the Lord Jesus with his spiritual anxieties; (*d.*) and is quite willing to deny him and give up his Christian hope; he may justly be desponding.

2. It may arise from ill health, or nervous derangement. If so one needs the doctor more than the minister, medicine than sermons.

3. It may be from a constitutional tendency. Some are as naturally gloomy as are deep gorges and ravines. They are made so. Their dollar is never more than seventy-five cents in their eyes.

4. It may arise from indulging in known sins, or habitual neglect of duty.

II. The remedies for religious despondency.

If it arise from constitutional causes or ill health, full relief must not be expected. For regeneration is not constitutional reconstruction, and grace is no physician; though modifications and slow improvements may be looked for under long and careful labor.

1. Thank God frequently and fully for all that grace has done.

2. Freely and fully unfold all your anxieties and troubles to the Saviour.

3. Confer intimately with a few experimental Christians, and compare your experience with theirs. More have these sad experiences than you suppose.

4. Study the experience of the saints, as David, Elijah, Peter, Paul, and Thomas. They had their dark days.

5. Do not spend so much time in watching your heart. It is a dark picture and will make one dark-minded. So much attention to dietetics and digestion will bring on dyspepsia.

6. Stop looking after enjoyment. It is a prize not to be taken by pursuing, or to be drawn by ticket.

7. Live a religious life on principles, not feelings.

8. Finally, forget yourself in working for others. Some desponding disciples only need work, as a Sabbath school class, the support of a Freedman's school, a half dozen sick neighbors, some poor orphan children, or the bringing of impenitent sinners to Christ. Doing this, they will praise God with a glad heart and cheerful face.

ARTICLE VII.

LITERARY NOTICES.

1. — *Congregationalism: What it is: Whence it is: How it works: Why it is better than any other form of church government: And its consequent demands.* By HENRY M. DEXTER. Boston: Nichols & Noyes. 1865.

WE do not know another so comprehensive summary of Congregationalism. It is historical, expository of the Scriptures, argumentative, well illustrated by the principles and usage of the New England fathers. On doubtful points, as on those obsolete, obsolescent or innovating, authorities and facts are given on all sides.

It was, of course, a difficult thing to arrange all this material in unfolding, consecutive form, and yet as a symmetrical whole. But Dr. Dexter has achieved a fair success, and the admirable *Analysis*, with the copious *Indexes*, carries the success still farther. Not a little in the vast amount of quotations, as foot notes, would, we think, have been better if incorporated with the text. The argument for the utility of Congregationalism in comparison with other systems, is strong and in many points fresh and new. We should like to see a manly reply to this by some of our Episcopal and Presbyterian brethren.

Of course there are sayings and positions in this able volume from which we should dissent, and in a minute analysis or review of the work, would specify our objections. We indicate some of them. The lines between Congregationalism and Independency should, we think, have been more boldly and distinctly drawn. Principles IV, and V, under chapter II, are deficient in this respect. The rash men of some churches in the heat of trouble should here find, for cool reading and reflection, the outlines and ends of their tendencies in Independency as another denomination. And moreover, we think it would have both set forth our polity and served the churches, to show under "Councils" that the *ex parte* council not unfrequently results practically in Independency, its members being often foreknown, foreordained and called, by a wide sweeping election, to carry a point against the advice and fellowship of a mutual council from the vicinage.

We think, also, that the definition of a church is essentially defective and open to very serious objection. It reads thus:

"Any company of people believing themselves to be, and publicly professing to be, Christians, associated by voluntary compact, on Gospel principles, for Christian work and worship, is a true church."

The many and local churches of men we suppose should be modelled after the one, unchanged and perpetual church of God. That recognizes and has for its human foundation the family rather than the individual. A distinctive, radical feature of God's earthly church, set forth in the Abrahamic covenant, is the family basis of it. Adult and Christian individuals, regardless of their "households" and "seed after them," have often seen fit by mutual agreement and promise to organize what they call a "church," and common, modern usage so designates such a body. But as the divine model alone can give pattern for a church, and the divine illustration alone can furnish a definition of a church, we submit that it is a misnomer to call that organization a church which ignores an organic law and element of God's earthly church. After granting this definition, it is a vain endeavor to claim divine authority for infant baptism, or that the children of believers have relations to the church of God, any more constitutional or hopeful than the children of unbelievers. It is evidently time to make more or less of this ordinance for children, and in order to this we must make more of some real principles, or less of some pretended ones.

The status of the "stated supply" is well defined as related to a council, but the reasons in support are strangely defective. It is no part of Congregationalism, as a living system, that one ceases to be a minister when he ceases to be a pastor. This colonial and Independent notion has long been obsolete, as it should be. Ordination is more than constituting and inaugurating a church officer for some definite body, whose official character must be lost so soon as he leaves that office in that particular church. The "stated supply" or "acting pastor" can not come to a council in answer to the call of the letter missive for "pastor and delegate" for the plain reason that he is not what the letter calls for, a pastor. And in Congregationalism nothing can constitute one a pastor but the act of a council properly convened for that purpose. Mr. Dexter gives too much prominence, for this day, to the idea that the church ordains its pastor through the council. Such an idea now is too theoretical and antiquarian for our modern views and usages; and it leaves the impression that a church may actually do the thing without a council. This would be going back to the Independency and Brownism of inchoate Congregationalism. Here indeed lies one of our leading objections to a generally admirable work. It has not recognized the progressive, developing changes in our system. The volume is not up with actual and practical Congregationalism, as two centuries have modified it. Still we say most cordially that the author has done good service in a field much neglected, and the publication is

eminently timely when our denomination is so nobly abandoning the policy of lying loosely about among other denominations.

2.—*Poems.* By MATTHEW ARNOLD. A new and complete edition. 16mo. pp. 336. Boston: Ticknor & Fields.

AMONG the best things of this writer's which we have read, is the Preface to this volume. It is a profound essay on the art of poetry — its elements of power and perpetuity. Like Henry Taylor's admirable dissertation preliminary to Philip Van Artevelde, it combats the opinions which degrade poetical literature by making it the vehicle of individual fancies, caprices and experiences, the expression mainly of passing, transient, exciting moods and movements, the minister of a wild and heady, or a trivial, purposeless enjoyment. Mr. Arnold has no such unworthy theory of this art. With him, the true material of poetry is great and noble human action—that which involves the working of our "permanent passions" which make men everywhere fellow to each other. How superior the ancients were to the moderns in seizing the best subjects of poetry, and in subordinating the mere expression or costume of the work to its central, unifying action, is strongly and neatly set forth. Not only do such writers as Keats, Byron, and even Wordsworth fail to abide the comparison, but Shakespeare himself is shown to be at fault in "clearness of arrangement, vigor of development, simplicity of style," though infinitely more "suggestive" than any of those statuesque old Greeks. The judgments of our author are given with a calm and simple positiveness which however is never dictatorial, that convinces you how thoughtfully and conscientiously he has revolved these matters and settled them in his own mind. We acknowledge a great indebtedness to any one who will thus set up the stakes and stones of the true boundary lines of literature, in these days of explosive writing and misleading criticism; albeit we may question whether here and there a bound stands just at the right point.

Although belonging to the classical rather than the romantic school of poetry, there is no lack of sentiment, passion, imaginative coloring in Mr. Arnold's verses. His thoroughly critical sense does not chill the warm flow of feeling, nor stiffen his genius into any rigid moods. He knows what life is, in its subtile, tense, incommunicable experiences; and touches the chords which vibrate through the innermost heart of humanity. He is a true poet, born, not made; not spoiled by the university: as genunie a son of song as Robert Burns among his native "braes." We open at random to

the tenderly beautiful stanzas "To Margurette." They strike a tone which echoes down into the lowest depths of the spirit.

> "Yes: in the sea of life enisl'd,
> With echoing straits between us thrown,
> Dotting the shoreless waters wild,
> We mortal millions live *alone.*
> The islands feel the enclasping flow,
> And then their endless bounds they know."

It is another and more delicate version of Jean Ingelow's "Divided." No one could have written either without deeply drinking at the Pierian spring, and deeply sounding the mysteries of existence. Mr. Arnold's subjectivity (we wish there was a synonym for this awkward word,) is as real as Byron's or the Brownings'; but it never becomes morbid or obscure. He strikes us as a singularly marked illustration of what Schiller calls "a healthy poetic temperament."

3.—*Essays in Criticism.* By MATTHEW ARNOLD, Professor of Poetry in the University of Oxford. 16mo. pp. xv, 506. Boston: Ticknor & Fields. 1865.

THIS is one of those unworldly, idealizing books that build around you a crystal-walled, crystal-domed palace in which you can calmly, wisely revel in the true, the good, the beautiful. Nevertheless, while saying this, we take exception to here and there a turn of thought and expression thrown out seemingly as a sort of good natured badinage at we hardly know what: as, p. 255, "the ocean of verbiage with which the controversy on justification by faith has flooded the world." This reminds us of the remark of a distinguished living metropolitan rector: "hang justification by faith!" not intended, of course, to be taken literally; but, rather, an impatient protest against some undue prominence given to that *articulus et seq.* Our churchly friends now and then surprise us with their "over vivacity." The purely literary efflux of this not particularly Oxford quality, is one of the best points of these Essays. The professor of poetry is a wit. His deprecatory preface, in which he comes so near saying *peccavi* to his critics, but always jumps nimbly up again before quite reaching his knees, is a capital piece of demurely jocose writing.

Mr. Arnold treats of the spirit and the applications of criticism in an exceedingly pure and elevated way. Criticism is, with him, the search, possession, enjoyment of that which, in universal letters and art, should be; the determining of the canons of taste and the results of thinking, as these exist not actually in popular standards and

models, but potentially, ideally, in things and thoughts themselves. He gives in one word,—"disinterestedness"—the rule of criticism. "Its business is .... simply to know the best that is known and thought in the world, and, by in its turn making this known, to create a current of true and fresh ideas." p. 17. Again: "I wish to decide nothing as of my own authority; the great art of criticism is to get one's self out of the way, and let humanity decide." p. 194. This is the key to Mr. Arnold's philosophy of literary eminence and lasting success. That which is vital with most of essential truth and beauty is best, and has the surest pledge of immortality. To discover, to assist this excellence, is the critic's work, irrespective of all transient fashions and interests. It is not wonderful that, in the application of these tests, the writer should demolish many idols of the hour, present and past; that he should find but little comparatively of what he seeks in many very pretentious quarters. That genuine "distinction" which the truest genius implies and contains, he tells us the world is impatient of: "it chafes against it, rails at it, insults it, hates it: it ends by receiving its influence, and by undergoing its law. This quality at last inexorably corrects the world's blunders, and fixes the world's ideas. It procures that the popular poet shall not finally pass for a Pindar, nor the popular historian for a Tacitus, nor the popular preacher for a Bossuet." p. 139. These choice spirits are the ever brightening "lucida sidera"; and the critic's study is to know the source of their light, and to judge all things under its sempiternal illumination.

The avenue to this judgment is not solely through a clearness of the intellect, on the one side, nor the rectifying of the moral impulses, on the other: but rather through what he calls "the imaginative reason"; or elsewhere, the "union of *soul* with intellect, and in the delightful result which this union produces." We can not follow the author's perspicuous and elegant elaboration of these ideas as he passes under review various subjects and topics of criticism. Some of our notes and references are—the Asiatic, Attic and Corinthian styles of writing; or, the over richly ornate, the finely chaste, the brassy, over-stretched, pp. 66—68: poetry—its power as the interpreter of natural and moral life, pp. 74 and 100: modern Philistinism—that is, the well to do, literary fogyism, "the strong, dogged, unenlightened opponent of the chosen people, of the children of light," p. 146, and frequently: the falseness of the religion of pleasure, as illustrated in the brilliant Epicurean genius of its high priest, Heine. The papers on this eminent *litterateur*, and on the Pagan and Mediæval Religious Sentiment, are full of deep and pathetic moral suggestiveness. That on Jourbert is a good philosophical

study: while the discriminations between the Christian and heathen ethics, and an intellectual and hearty love of God, in the essays on Spinoza and Marcus Aurelius, are clearly and convincingly made. The volume closes with the somewhat famous lectures On Translating Homer. When now we add that Mr. Arnold's style is refreshingly easy and artless, as if, conscious of the store of golden thought with which it is charged, allowing itself to have its own free way even, at times, to the very verge of negligence, but never quite pass ing that line, we have said enough to indicate the uncommon value and attractiveness of this reprint.

4.—*Speeches of John Bright, M. P., on the American Question.*- With an Introduction: By Frank Moore. 12mo. pp. xv, 278. Boston: Little, Brown & Co. 1865.

The distinguished ability which Mr. Bright has shown in advocating popular rights at home, here displays itself in defending our quarrel with the South, before the British public. His style of oratory is well fitted to influence average minds, and he has grasped the main points in our recent history with characteristic strength. We are certainly desirous to give him credit for as much disinterestedness in this cause as politicians anywhere can reasonably claim; but we confess a feeling of distrust concerning his very deep regard for the interests of justice and freedom in our land, since we have learned, through authentic sources, that he has recently written a letter of a dozen pages to one of our distinguished Senators, earnestly pleading for the life of Jefferson Davis, because, forsooth, his execution would act as a check upon European revolts from the monarchial powers, in favor of republican interests. To which we simply say, that European liberalists must take their chances in inaugurating resistance to existing dynasties; and if they are not ready to risk being hung for a failure, they do not deserve to succeed. Mr. Bright's logic, to our mind, savors strongly of a cowardice which speeches even as good as these hardly offset. If his rumored visit to our country has anything to do with promoting this end, we hope our government will put no national vessel at his service.

5.—*The Story of the Great March.* From the Diary of a Staff Officer. By Brevet Major George Ward Nichols, Aid-de-Camp to General Sherman. With Map and Illustrations. 12mo. pp. 394. New York: Harper & Brothers. 1865. [Boston: A. Williams & Co.]

The field-notes of a constant wi'ness of these scenes and events, "written during the mid-day rest of the army, on fences and stumps by the way side, by the light of the camp-fires in the night bivouac,

in cities and towns at which we halted, whenever and wherever a moment's release from official duties afforded leisure to jot down the fleeting impressions of our long and wonderful march"—this is the material of these pages. The story thus secures freshness, variety, accuracy, life, if at the expense occasionally of the best grammatical usage. It is a valuable record of a most astonishing campaign: not a register of battles, for there was not much fighting; but the narrative of the exciting, picturesque and hilarious out-door life of sixty or seventy thousand men on a swift and dangerous raid through three hostile States, vividly displaying the matchless strategic and military genius of the commanding officers, and the almost fabulous bravery, fortitude and enthusiasm of our veteran troops. The author's position on Gen. Sherman's staff gives him an inside view of the propelling machinery of the whole movement which imparts a semi-official character to his work. The numerous sketches of corps and division commanders, as Howard, Slocum, Logan and others, are well drawn. It is a splendid drama with a grandly glorious consummation. A full appendix of official documents of the commanding General and others, mostly relating to the concluding peace negotiations, adds much to the permanent value of the volume. The map, with the lines of march of each army corps, is a great help to a full understanding of the narrative.

6.—*The Secret Service, the Field, the Dungeon, and the Escape.* By Albert D. Richardson, *Tribune* correspondent. 8vo. pp. 512. Hartford: American Publishing Company. 1865.

Mr. Richardson had good materials for a book, and he has used them cleverly. He lets us into the interior of the early days of the war particularly, and also into the romance, hazard and nonchalance of a special correspondent's life in times like '61 and following. The sketching is free, and dashed with a humor which we should not have inferred from the demure photograph of the author fronting the title page. There is a little too much Scripture allusion in ludicrous relations. We are sorry too, that the book is marred with an evident endorsement of the shallow notion of Universalism, p. 236, that to die on the battle-field for a good cause is enough to carry a man to heaven, wicked as he may be. Mr. R. thinks it a shame to speak of the thief on the cross to a dying soldier of this description! Does he mean, moreover, to say that the Romish chaplains have done their work, in our armies, more judiciously and Christianly than the Protestant; and does he think the fling very decent at the Presbyterian clergyman, p. 383, about giving tracts on the sin of dancing to men without any legs? We regret to see the theology of the *Tribune*

cropping out, in these places, quite as plainly as its political *animus* shows itself in the writer's fierce assaults upon General Halleck and Secretary Stanton. The special correspondent's letters should have been pruned somewhat more closely of these *Tribunean* spurs, before they grew into a book.

The author's style is better fitted to the gossipping, sketchy demands of newspaper correspondence than to the continuous narrative of an essentially historical volume. There is also too much Shakesperiana in chapter headings like an *a la mode* novel, and elsewhere along these pages, though some of the scraps and mottoes are pat enough to the purpose. We get much lively writing, and some fresh and broad characterization of famous and infamous persons from these reminiscences.

7.—*The Person of Christ: The Miracle of History.* With a Reply to Strauss and Renan, and a collection of Testimonies of Unbelievers. By Philip Schaff, D.D. 16mo. pp. 375. Boston: American Tract Society, 28 Cornhill. 1865.

The value of this book is not to be estimated by its bulk. The distinguished author has worked into it the best thoughts and arguments which the whole literature of this subject enshrines, thus giving, in a very condensed manner, a synopsis of and a supplement to the discussion of the central theme of Christianity, which was greatly wanted for popular use. He takes the narrative of Christ's person and life as recorded in the Gospels, and thence deduces the probability and the fact of the miracles which he wrought. Himself a miracle, it was natural and necessary that he should enact the miraculous. This is the drift of the volume.

A large body of critical notes is added to the text, full of learned information, and especially rich in personal notices of prominent assailants of the Gospels. This is followed by over one hundred pages of citations to the excellence of Christ's character and teachings from unbelievers, running down the list from Pontius Pilate and his wife, through the Jewish, Pagan, French, German, American, English sceptical authors to our own day. There is considerable interest and some value in this mass of confession, though we are not disposed to lean much weight on such props. The author gives this section of his book as a fragment. We should not advise its enlargement in future editions. Napoleon Buonaparte's forty pages are perhaps readable: Frances Power Cobbe's nearly twenty look too much like padding.

8.—*Travels in Central Asia;* Being the account of a Journey from Teheran across the Turcoman Desert to Khiva, Bokara and Samarcand, in the year 1863. By ARMINIUS VAMBERY. 8vo. pp. 493. New York: Harper & Brothers. 1865. [Boston: A. Williams & Co.]

RELIGIOUS fanaticism and national jealousies effectually debar to European exploration the countries directly east of the Caspian Sea. No Frankish traveller (which means everything civilized outside of Islam) can pass those barriers, or, if found inside of them in disguise, he would be immediately killed or else sold into bondage. These Turkomans are the most perfidious, cruel, religious of all who follow the False Prophet. Their political platform is—isolation from foreigners; extirpation of foreigners. Russian war-steamers on the Caspian hold them under some restraint, but they annually enslave and destroy numbers of the Persians and other contiguous populations. Their country, with some exceptional intervals, is as desolate as the people are mendacious and cruel.

In the face of these appalling dangers M. Vambery succeeded in penetrating those regions even to their most central and sacred cities, and in bringing back this account of his visit. His book records a rare triumph of human ingenuity and perseverance. The motive of his journey was mainly the philological enthusiasm which had prompted his early studies, and which procured for him a commission to attempt the investigation of the language of those central Asiatic tribes, from the Scientific Academy of Pesth in his native Hungary. A long sojourn at Constantinople made him familiar with Turkish life, manners, affairs, both civil and religious. Assuming the character of a pilgrim mendicant dervish, the begging friars of the East, he gradually made his way through Persia to the Caspian, and in company of a returning band of similar religious pilgrims whose confidence he had won, he accomplished his survey of their country.

The narrative is very exciting, as we remember that the author was continually liable to detection by these most suspicious and observant barbarians, who often seemed just ready to penetrate his "counterfeit presentment," the consequence of which would have been the instant death of a spy, and, worse than that, of a religious interloper. It was like Clodius stealing in woman's attire within the penetralia of Bona Dea's vestal maidens. To lull suspicion, he did not dare to ask questions, take notes, or seem interested in anything except the routine of his dervish ceremonial. But using keenly his limited means of observation, especially listening, while apparently half asleep, to the voluble talk around him, our author con-

trived to produce this goodly octavo of intelligible information concerning those regions, and to lay by material for a philological work which is promised in due time. These pages add an important contribution to our geographical and general knowledge. They largely extend our acquaintance with the *genus humanum* in a hitherto exceedingly obscure quarter. Here is a decidedly original argument for domestic slavery:

"I once put the question to a robber, renowned for his piety, how he could make up his mind to sell his Sunnite brothers as slaves, when the Prophet's words were: 'Every Mussulman is free.' 'Behey!' said the Turkoman, with supreme indifference, 'the Koran, God's book, is certainly more precious than man, and yet it is bought and sold for a few krans. What more can you say? Yes, Joseph, the son of Jacob, was a prophet, and was himself sold. Was he, in any respect, the worse for that?'" pp. 357, 358.

This work is handsomely illustrated and published; but where is the index? Books like this and Speke's Africa should not lack that indispensable key.

9.—*Cape Cod.* By Henry D. Thoreau. 16 mo. pp. 252. Boston: Ticknor & Fields. 1865.

This is the most wholesome production of this physically and spiritually morbid writer which we have read. It is better ventilated. There is salt enough in it to save it. The strong sea-breeze seems, for once, to have blown a healthy influence through him. The solitude and stillness of those lone reaches, broken only by the roll and roar of the ocean, their desolation and wild freedom, the traditions of storm and wreck which haunt those coasts, the unique and adventurous life of the people — ploughers of the deep — all this took a powerful hold on Thoreau's imagination, and he has reproduced it in this "prose sea idyl" with very great ability. But this, as all of his, is essentially mundane. You never lose the echo of his heavy-soled foot-fall, even on those pathless sands. With all his looking through nature, he gets no better vision of nature's God than did Cicero or Pliny. He belonged to the Pantheon. It is marvellous how little Christianity may do for an intellectual man who lives all his days near the very focus of its light. The last published line of his, written by an amanuensis a little before the end, is as marvellous as the rest: "I *suppose* that I have not many months to live; but, of course, I know nothing about it. I may add that I am enjoying existence as much as ever, and regret nothing."

10.—*Letters to Various Persons.* By HENRY D. THOREAU. 16mo. pp. 229. Boston: Ticknor & Fields. 1865.

LETTER-WRITING was not Thoreau's forte. He did not love it. His epistles show it. They travel like a large boy at the top of a tall pair of stilts — no joints at the knees nor anywhere else, though here and there, there is an effort at limbering. They have too much of a bantering and a moralizing tone in them, with a dash now of Diogenes' tub, and now of Robinson Crusoe's wildness, but not of his yearning tenderness. Thoreau's love of nature was not mellow and warm. These letters disappoint us. We liked the man better before reading them. But there are good thoughts in them — thus: "When we would rest our bodies we cease to support them; we recline them on the lap of earth; so when we would rest our spirits, we must recline on the Great Spirit." But what more than the old god Pan is that Spirit, one has difficulty in determining. Here is a touch of his theology: "Let God alone, if need be. Methinks, if I loved him more, I should keep him — I should keep myself, rather — at a more respectful distance. . . I say, God. I am not sure that that is the name." p. 58.

The practical ethics is quite as orphic. "How wholesome winter. is, seen far or near; how good, above all mere sentimental, warm-blooded, short-lived, soft-hearted, *moral* goodness, commonly so-called. . . None of your *just made perfect* — pickled eels! All that will save them will be their picturesqueness, as with blasted trees. Whatever is, and is not ashamed to be, is good." p. 194. That is smart; but what is this? "To succeed in letting one thing alone in a winter morning, if it be only one poor, frozen-thawed apple that hangs on a tree, what a glorious achievement! Methinks it lightens through the dusky universe." p. 58.

Stuff! But the spiritualists get some sharp and hard hits which atone for a good deal of Concord transcendentalism, materialism, and Hindu-mania.

The few poems at the end of this volume are not more successful than their epistolary antecedents. The last three of them are on "Smoke," "Mist," "Haze."

11.—*The Man without a Country.* Boston: Ticknor & Fields. 1865.

A REMARKABLE piece of verisimilitude-writing is this little reprint from the *Atlantic*. Defoe could not have told the story in more idiomatic language, or with more naturalness of manner. The lesson of patriotism which it has taught, is as admirable as the style in which it is conveyed.

12.—*Hours at Home:* a Popular Monthly Devoted to Religious and Useful Literature. Edited by J. M. SHERWOOD. May to August. New York: Charles Scribner & Co. 1865.

THIS aspires to be a successful enterprise in the direction of that greatest of recent periodical successes — *Good Words*. Its purpose is to supply a polite Christian literature — a regenerated *belles lettres*, to its patrons. It aims to be elegant and pure, elevated and wholesome. We commend its noble ambition, and see not why it should not accomplish its object with such writers on its staff as the Rev. Drs. Bushnell, Sprague, H. B. Smith, Schaff, Thompson of New York, Gillett, Anderson of Boston, Bacon of New Haven, Nelson of St. Louis, and Professors Noah Porter, and Smyth of Andover. This is a strong force of pens, and their contributions, as of others here employed, are sensible and to the point for the most part. But the editor must beware of stranding on the lee shore of old sermons and prosy homilies. What is good for the pulpit or for the *National Preacher* may be death to a Monthly. We offer him the advice which a veteran journalist once gave ourselves: "Put plenty of yeast in your dough."

13.—*Empirical Psychology; or, The Human Mind as given by Consciousness.* For the use of Colleges and Academies. By LAURENS P. HICKOK, D.D., Union College. Second Edition. New York: Ivison, Phinney, Blakeman & Co. 1864.

As a text book this is well prepared by its distinguished author. Of its theories and contents we have, for substance, spoken sufficiently elsewhere in this number of our Review in an extended examination of Dr. Hickok's "Rational Psychology."

14.—*A System of Moral Science.* Third Edition. By the same author and publishers.

A SIMPLE, practical and able treatise.

ARTICLE VIII.

THE ROUND TABLE.

ABILITY AND INABILITY. It is pleasing to see how ability and burdens are proportioned to each other among the clergy. A feeble church with small salary is usually able, doubtless from its healthy location, to get a pastor who can live and be strong and useful from year to year without any vacation. If the salary go above five or six hundred the place is somewhat enervating, and he really seems

to need two or three weeks of recreation. If the society be a stirring, independent body, and scorn the idea of paying less than twelve hundred, a long vacation, and often a long purse with it, comes as a matter of course to the exhausted laborer.

But what is singularly fortunate, showing the wise adaptations of providence, the locations that are most sickly and enervating to the clergy, calling for the longest and most expensive vacations, are just those that can best afford it. The wonder is that ministers wishing settlements are not shy of those societies that pay two and three and four thousand dollars, for the pastor's health is almost sure so far to fail as to require a three months' trip to England, six months on the Continent, or even a year or two up the Mediterranean and through the Holy Land and Egypt. But the wind is tempered to the shorn lamb, whether it browse on its own village hillside, or the Alps, or along the Nile. Still the fact remains for curious inquirers and the solution of *savans*, why among the clergy frequent indisposition, chronic diseases, and those requiring long vacations and foreign travel, should prevail most among wealthy and liberal parishes.

We only add that a fact, abnormal yet germane, enhances the curiosity, and the difficulty of solution. Sometimes a minister, unable to reach England, Saratoga, or the White Mountains even, is cured by changing his location a few miles and his salary a few hundred dollars. His bronchial difficulties, vertigo, cerebral pressure of blood, dyspepsia or general weakness (of body we mean), is relieved by a change of neighborhood as effectually as his brother minister found relief abroad; or his wife, who is of delicate health, but fortunately wealthy, escapes the east winds and feels nicely by moving ten miles farther down the coast or nearer the city.

Indeed this matter of clerical health as related to the amount of salary, like the effects of Sabbath heat and cold and rain and snow on some persons, is a subject far from being well understood. It is an inviting field for investigation, and we suggest that it be explored jointly by doctors of medicine and doctors of divinity.